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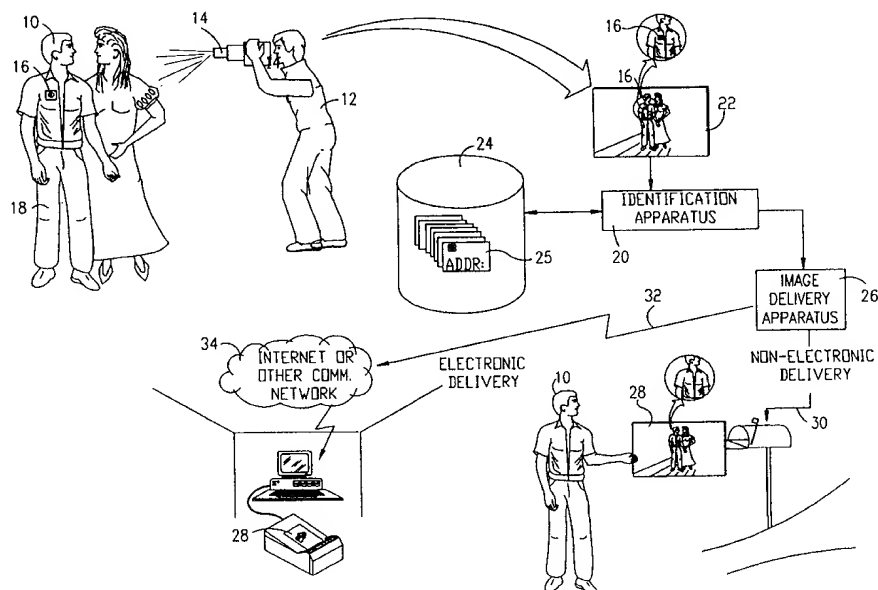
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(54) Title: IMAGE IDENTIFICATION AND DELIVERY SYSTEM

**(57) Abstract**

This invention discloses a method for providing pre- and post-event communication with a participant in a gathering including the steps of transmitting an invitation (34) to an intended participant (10), wherein the invitation is associated with an electronic record of the participant (25), producing a photograph of the participant wherein the participant is identified with said electronic record (20), and providing the photograph to said participant by using said electronic record (28 or 30).

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## IMAGE IDENTIFICATION AND DELIVERY SYSTEM

### FIELD OF THE INVENTION

The present invention relates to photographic systems in general, and in particular to image identification and delivery systems.

### BACKGROUND OF THE INVENTION

A participant in a gathering, such as a wedding, who wishes to order photographs taken of him typically views photographs of the gathering and places an order for specific photographs. This method is disadvantageous in that it is not automatic and in that the participant often must view more photographs than just those in which he appears.

The disclosures of all publications mentioned in the specification and of the publications cited therein are hereby incorporated by reference.

### SUMMARY OF THE INVENTION

The present invention seeks to provide a novel system for automatically providing photographs to participants that appear in the photographs.

There is thus provided in accordance with a preferred embodiment of the present invention a method for providing pre- and post- event communication with a participant in a gathering including the steps of transmitting an invitation to an intended participant, the invitation is associated with an electronic record of the participant, producing a photograph of the participant the participant is identified with the electronic record, and providing the photograph to the participant by using the electronic record.

There is also provided in accordance with a preferred embodiment of the present invention a method for providing pre- and post- event communication with a participant in a gathering including the steps of transmitting an invitation to an intended participant, the invitation is associated with an electronic record of the participant and the gathering, providing the intended participant access to a gift wish list via the electronic record, selling a gift to the intended participant using the electronic record, updating the gift wish list based on a past purchase, using the electronic record, and

generating a thank-you note using the electronic record and purchase record associated therewith.

Further in accordance with a preferred embodiment of the present invention the method also includes the steps of producing a photograph of the participant the participant is identified with the electronic record, and providing the photograph to the participant by using the electronic record.

Still further in accordance with a preferred embodiment of the present invention the photograph is provided to the participant together with the thank you note.

Additionally in accordance with a preferred embodiment of the present invention the at least some of the communication with the participant is electronic.

There is also provided in accordance with a preferred embodiment of the present invention a method for distributing a photograph to a participant in a gathering including the steps of producing a photograph of the participant the participant is identified with an electronic record, and providing the photograph to the participant by using the electronic record.

Further in accordance with a preferred embodiment of the present invention the step of producing the photograph of the participant includes the step of associating an individualized computer readable identifier with the participant, and the step of providing the photograph includes the step of employing the identifier to associate the photograph with the participant and the electronic record.

Still further in accordance with a preferred embodiment of the present invention the step of producing the photograph includes the step of eliminating the identifier from the photograph.

Additionally in accordance with a preferred embodiment of the present invention the providing step includes posting the photograph on the Internet.

There is also provided in accordance with a preferred embodiment of the present invention a method for providing photographs of participants in an event to those participants including the steps of providing to each participant an identifier tag, photographing participants wearing the identifier tags, detecting and decoding identifier tags, associating images which include a tag with at least one alphanumeric code corresponding to an identifier tag worn by a participant, and ordering images by participants supplying the alphanumeric code.

Further in accordance with a preferred embodiment of the present invention the identifier tag is a color coded identifier tag.

Preferably the step of ordering images includes the step of communicating the alphanumeric code via a computer network.

Additionally in accordance with a preferred embodiment of the present invention the step of ordering images includes the step of communicating image data via a computer network.

There is also provided in accordance with yet another embodiment of the present invention a method for providing photographs of participants in an event to those participants including the steps of photographing participants; associating images which include at least one participant's face with information relating to that participant's face; and ordering images by a participant by supplying at least characteristics of the participant's face.

There is also provided in accordance with a preferred embodiment of the present invention a method of providing recognition information to a user meeting a person to be recognized including the steps of providing an identifier tag to a person to be recognized, using a camera, viewing a person to be recognized wearing the identifier tag, detecting and decoding the identifier tag, associating the identifier tag with identification data relating to a known person using a database, and supplying the identification data to the user.

Preferably the identifier tag is a color coded identifier tag.

Further in accordance with a preferred embodiment of the present invention the step of supplying the identification data includes supplying an audio input to the user.

Still further in accordance with a preferred embodiment of the present invention the step of supplying the identification data includes supplying a visually sensible input to the user.

There is also provided in accordance with a preferred embodiment of the present invention a method of providing recognition information to a user meeting a person to be recognized including the steps of using a camera, viewing a person to be recognized, associating an image provided by the camera with identification data

relating to a known person using a database, and supplying the identification data to the user.

Further in accordance with a preferred embodiment of the present invention the step of supplying the identification data includes supplying an audio input to the user.

Additionally or alternatively, the step of supplying the identification data includes supplying a visually sensible input to the user.

There is thus provided in accordance with a preferred embodiment of the present invention a system for providing pre- and post-event communication with a participant in a gathering including an invitation transmitter, transmitting an invitation to an intended participant, wherein the invitation is associated with an electronic record of the participant, a photograph generator, producing a photograph of the participant wherein the participant is identified with the electronic record, and a photograph distributor, providing the photograph to the participant by using the electronic record.

There is also provided in accordance with a preferred embodiment of the present invention a system for providing pre- and post- event communication with a participant in a gathering including the steps of an invitation transmitter, transmitting an invitation to an intended participant, wherein the invitation is associated with an electronic record of the participant and the gathering, a gift database, providing the intended participant access to a gift wish list via the electronic record, transaction software, selling a gift to the intended participant using the electronic record, a database input device, updating the gift wish list based on a past purchase, using the electronic record, and an acknowledgement system, generating a thank-you note using the electronic record and purchase record associated therewith.

Still further in accordance with a preferred embodiment of the present invention also including a photograph generator, producing a photograph of the participant wherein the participant is identified with the electronic record, and a photograph generator, providing the photograph to the participant by using the electronic record.

Moreover in accordance with a preferred embodiment of the present invention the photograph is provided to the participant together with the thank you note.

Preferably at least some of the communication with the participant is electronic.

There is further provided in accordance with a preferred embodiment of the present invention a system for distributing a photograph to a participant in a gathering including the steps of a photograph generator, producing a photograph of the participant wherein the participant is identified with an electronic record, and a photograph distributor, providing the photograph to the participant by using the electronic record.

Preferably the photograph generator includes an associator, associating an individualized computer readable identifier with the participant, and the photograph distributor employs the identifier to associate the photograph with the participant and the electronic record.

Further in accordance with a preferred embodiment of the present invention the photograph generator is operative to eliminate the identifier from the photograph.

Still further in accordance with a preferred embodiment of the present invention the photograph distributor is operative to post the photograph on the Internet.

There is further provided in accordance with a preferred embodiment of the present invention a system for providing photographs of participants in an event to those participants who are photographed wearing identifier tags including a detector and a decoder for detecting and decoding identifier tags, a database, associating images which include a tag with at least one alphanumeric code corresponding to an identifier tag worn by a participant, and an image distributor providing the images in response to receipt of the alphanumeric code.

Preferably the identifier tag is a color coded identifier tag.

Additionally in accordance with a preferred embodiment of the present invention the image distributor employs communication of the alphanumeric code via a computer network.

Further in accordance with a preferred embodiment of the present invention the image distributor employs communication of image data via a computer network.

There is also provided in accordance with a preferred embodiment of the present invention a system for providing photographs of participants in an event to those participants including a database, associating images which include at least one participant's face with information relating to that participant's face, and an image distributor providing images of a participant in response to receipt of at least characteristics of the participant's face.

There is further provided in accordance with a preferred embodiment of the present invention a system of providing recognition information to a user meeting a person to be recognized including the steps of an identifier tag worn by a person to be recognized, a camera viewing a person to be recognized wearing the identifier tag, a detector and a decoder operative to detect and decode the identifier tag, a database, associating the identifier tag with identification data relating to a known person, and an identification data user interface, supplying the identification data to the user.

Preferably the identifier tag is a color coded identifier tag.

Moreover in accordance with a preferred embodiment of the present invention the identification data user interface is operative to supply an audio input to the user.

Additionally or alternatively the identification data user interface is operative to supply a visually sensible input to the user.

There is also provided in accordance with a preferred embodiment of the present invention a system of providing recognition information to a user meeting a person to be recognized including the steps of a camera viewing a person to be recognized, a database, associating an image provided by the camera with identification data relating to a known person, and an identification data user interface, supplying the identification data to the user.

Preferably the identification data interface supplies an audio input to the user.

Additionally in accordance with a preferred embodiment of the present invention the identification data interface includes supplying a visually sensible input to the user.

According to a preferred embodiment of the present invention, the following scenario may occur:



- a. An individual takes photographs and sends them to be developed. The pictures are scanned and stored in an information reservoir indicating the number of the film without identifying individuals in the pictures.
- b. If one of the participants in the picture wishes to receive the picture s/he calls an identified telephone number and keys in the code of the film.
- c. The identity of the caller can be determined out automatically e.g. by a conventional "identified caller" function.
- d. The pictures may, for example, be sent to the street address associated with the telephone used to order the pictures.
- e. The caller's telephone bills may be charged for the pictures or any other suitable billing scheme may be employed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated from the following detailed description, taken in conjunction with the drawings in which:

Fig. 1 is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with a preferred embodiment of the present invention;

Fig. 2 is a simplified flowchart illustration of a preferred mode of operation of the system of Fig. 1;

Fig. 3 is a simplified pictorial flow illustration of a method of providing identification tag 16 to participant 10 operative in accordance with a preferred embodiment of the present invention;

Fig. 4 is a simplified pictorial illustration of another method of providing identification tag 16 to participant 10 operative in accordance with a preferred embodiment of the present invention;

Figs. 5 and 6, taken together, are simplified pictorial flow illustrations of a gift fulfillment system constructed and operative in accordance with a preferred embodiment of the present invention;

Fig. 7 is a simplified flowchart illustration of a preferred mode of operation of the system of Figs. 5 and 6 operative in accordance with a preferred embodiment of the present invention;

Fig. 8 is a simplified pictorial illustration of an alternate system used in identifying participant 10 of Fig. 1 constructed and operative in accordance with a preferred embodiment of the present invention;

Fig. 9 is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with another preferred embodiment of the present invention;

Fig. 10 is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with another preferred embodiment of the present invention;

Fig. 11 is a simplified flowchart illustration of a preferred mode of operation of the system of Fig. 10;

Fig. 12 is a simplified flowchart illustration of a preferred method of detection and decoding of an identifier tag in accordance with a preferred embodiment of the present invention;

Fig. 13 is a simplified flowchart of part of the method of Fig. 12;

Fig. 14 is a simplified flowchart of another part of the method of Fig. 12;

Fig. 15 is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with yet another preferred embodiment of the present invention;

Fig. 16 is a simplified flowchart illustration of a preferred mode of operation of the system of Fig. 15;

Figs. 17A and 17B are simplified pictorial illustrations of an instantaneous personal identifier system constructed and operative in accordance with two preferred embodiments of the present invention;

Fig. 18 is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with still another preferred embodiment of the present invention;

Fig. 19 is a pictorial illustration of a typical tag; and

Fig. 20 is a table of typical colors for the typical tag of Fig. 19.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to Fig. 1 which is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with a preferred embodiment of the present invention, and Fig. 2 which is a simplified flowchart illustration of a preferred mode of operation of the system of Fig. 1. In the system of Fig. 1 a participant 10 is shown at an event, such as a wedding, and is being photographed by a photographer 12 holding a camera 14. Camera 14 may be any known conventional or digital camera capable of taking photographs. Participant 10 preferably wears an identification tag 16 having a discernible pattern. Alternatively, tag 16 may be a printed or otherwise integrated design on an outer garment 18 of participant 10.

Photographic image 22 is preferably scanned and electronically provided to identification apparatus 20, or electronically provided by camera 14 where camera 14 is a digital camera. Identification apparatus 20 preferably employs techniques well known in the art for locating identification tag 16 within a photographic image 22 and comparing identification tag 16 with an event/participant database 24 in order to identify the intended recipient of the photographic image 22 such as participant 10. Database 24 typically comprises at least one preprogrammed record 25 including an image of identification tag 16 or any known representation of tag 16 that may be used in locating tag 16 in image 22 using methods known in the art. Record 25 also preferably includes address information regarding the intended recipient or recipients of images in which identification tag 16 has been located. The address information may include electronic mail addresses, postal addresses, and any other well known addressing information. Record 25 may also include an identifier identifying participant 10 as a participant in one or more events.

Additionally or alternatively, the pattern on tag 16 may include identity and/or address information of participant 10 using encoding techniques known in the art such as a bar code. This information need not be stored in database 24 as identification apparatus 20 may decode it using decoding techniques known in the art.

Image delivery apparatus 26 is also preferably provided for delivering photographic image 22 to the address or addresses indicated in database 24 for

identification tag 16. Delivery methods may include postal service such as is shown at 30, electronic mail via a network 34, such as the Internet, as is shown at 32, or any other known delivery means. Either of identification apparatus 20 and image delivery apparatus 26 is preferably capable of removing identification tag 16 from photographic image 22 using known image editing techniques, such as is shown by a photograph 28 received by recipient 10 in which tag 16 has been removed.

Reference is now made to Fig. 3 which is a simplified pictorial flow illustration of a method of providing identification tag 16 to participant 10 operative in accordance with a preferred embodiment of the present invention. A server 36 is provided with database 24. In one embodiment, server 36 sends an invitation 42 electronically to a computer terminal 38 of participant 10 via network 34 together with a printable image of identification tag 16 or other known file format or software which may be used to print tag 16 at a printer 40, typically on adhesive paper which may be worn. In another embodiment, server 36 prints out tag 16 at a printer 44 or tag 16 is otherwise manufactured, typically on adhesive paper which may be worn. A printed invitation 46 is then sent together with tag 16 to participant 10 via regular mail as is shown at 48. In another embodiment, participant 10 provides identification and/or address information to server 36, such as via HTML forms at a World Wide Web site maintained by server 36 and accessible to participant 10. Tag 16 is then selected and sent to participant 10, and the information received from participant 10 is either stored in database 24 together with the associated tag information or encoded into tag 16 as described above, or both.

Fig. 4 is a simplified pictorial illustration of another method of providing identification tag 16 to participant 10 operative in accordance with a preferred embodiment of the present invention. A computer terminal 50 is provided with database 24, typically at the entrance of a banquet hall. Participant 10 enters his address information which is then stored in database 24 together with information regarding a tag, such as tag 16, selected from a pool of unused tags or otherwise uniquely generated for the participant and the event. Terminal 50 then prints tag 16 at a printer 52 such as on adhesive paper which may be worn.

Reference is now made to Figs. 5 and 6 which, taken together, are simplified pictorial flow illustrations of a gift fulfillment system constructed and

operative in accordance with a preferred embodiment of the present invention, and Fig. 7 which is a simplified flowchart illustration of a preferred mode of operation of the system of Figs. 5 and 6. As in Fig. 3, server 36 is provided with database 24, and additionally with a gift database 54. Gift database 54 typically includes preconfigured gift lists for one or more events, such as lists of wedding gifts for brides and grooms. Server 36 typically sends a gift list 56 electronically to computer terminal 38 of participant 10 via network 34. Gift list 56 preferably indicates the gifts that have not yet been chosen and may be sent in HTML or any other known format. An invitation 58 is preferably sent to participant 10 providing both a user identification and an event identification. Participant 10 selects one or more gifts and sends a gift purchase request to server 36, preferably including appropriate user identification and event identification and payment or billing information. Gift database 54 is updated to reflect the gift purchase request.

Fig. 6 shows server 36 providing a thank you note to participant 10 based on the his gift purchase recorded in gift database 54 and using address information from database 24. In one embodiment, server 36 sends a thank you message 60 electronically to computer terminal 38 of participant 10 via network 34. In another embodiment, server 36 prints out a thank you note 62 at printer 44 which may then be sent to participant 10 via regular mail as is shown at 64.

Fig. 8 is a simplified pictorial illustration of a method of identifying participant 10 of Fig. 1 to be used in place of or in addition to employing identification tag 16 as described hereinabove with reference to Figs. 1 - 4, and operative in accordance with a preferred embodiment of the present invention. Computer terminal 50 is provided with database 24, typically at the entrance of a banquet hall. Participant 10's face is scanned at a scanner 66 and encoded using any known face scanning and encoding system. Participant 10 also enters his address information which is then stored in database 24 together with his encoded face information. Identification of participant 10 may be performed as described in Figs. 1 - 2 with the exception that participant 10 is identified using the encoded face information stored in database 24.

Reference is now made to Fig. 9 which is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with another preferred embodiment of the present invention. In the system

of Fig. 9 a camera 68 is typically provided in a fixed location, such as along a boardwalk in an amusement park. An amusement park goer 70 is preferably provided with a smart card 72 onto which information is stored identifying park goer 70, such as his address. Smart card 72 may be any known smart card or tag capable of sending transmissions. Card 72 may additionally be capable of receiving transmissions. A communications unit 74 is also provided for communicating with card 72 and controlling camera 68. A computer 76 is also provided for communicating with unit 74.

Typical operation of the system of Fig. 9 is now described. In one embodiment, card 72 periodically transmits a signal that, when park goer 70 comes within a predetermined range from camera 68, is received by unit 72 which then triggers camera 68 to photograph park goer 70. The signal may include information identifying park goer 70, or, upon receiving the signal from card 72, unit 74 may transmit a signal requesting identification information which card 72 then transmits to unit 74. In another embodiment camera 68 is set to photograph periodically. As camera 68 takes a photograph, unit 74 transmits a signal requesting identification information from any smart card within the camera's range and card 72, being within range, responds by transmitting park goer 70's identification information.

Computer 76 preferably stores the photograph taken by camera 68 together with the identification information received from card 72 and stores the information in a database 78. The photographs may be automatically delivered to park goer 70 in the same manner as described hereinabove with reference to Figs. 1 - 2, or delivered after selection and payment at an electronic kiosk 80 designated for this purpose.

It is appreciated that the steps described with reference to Figs. 2 and 7 need not necessarily be performed in the order shown unless otherwise indicated, and that in fact different implementations of the steps may be employed to yield similar overall results.

Reference is now made to Fig. 10, which is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with another preferred embodiment of the present invention and Fig. 11 which is a simplified flowchart illustration of a preferred mode of operation of the system of Fig. 10.

In the system of Fig. 10, one or more participants 110 are shown being photographed at an event, such as a reception, by a photographer 112 holding a camera 114. Camera 114 may be any known film or electronic camera capable of taking photographs, such as video photographs or still photographs.

Each participant 110 preferably wears an identifier tag 116. The identifier tag 116 may be in any suitable form, such as a badge, a pin, a sticker or a necklace or alternatively may be integrated with a worn garment.

In accordance with a preferred embodiment of the present invention, the identifier tag 116 preferably comprises a color and pattern coded tag, having coding in at least two dimensions, such as color and position. Alternatively, the identifier tag 116 may be coded in a greater or lesser number of dimensions, such as only color. It is important, however, that the identifier tag 116 be readily detectable to a degree allowing for straightforward decoding thereof by automatic scanning apparatus, wherein variations in camera angles and lighting do not generally defeat successful detection.

A preferred form of identifier tag 116 is a generally circular tag, as shown, having a circular central region 118 surrounded by variously colored segments 120, the coding of which readily identifies the wearer and corresponds to an alphanumeric identification code 122, which is preferably printed on the tag 116.

Identification code 122 may be printed on the back of the tag 116 or alternatively at any appropriate location on the front thereof, such as in the central region 118 or in one or more of colored segments 120. It is appreciated that the color coded identifier tag described hereinabove and shown in Fig. 10 is much more readily detectable and decodable than would be a conventionally bar-coded tag of similar size.

A photographic image 123 taken of participants 110 by camera 114 is provided in electronic form to identification apparatus 124 either directly from a digital camera or via a scanner (not shown), when a film camera is employed.

Identification apparatus 124 preferably employs techniques well known in the art for locating identifier tag 116 within the photographic image 123, decoding the tag and associating each photographic image 123 with the alphanumeric identification code 122 corresponding to each person appearing in the photographic image. Identification apparatus 124 preferably downloads both the images and the alphanumeric identification code or codes associated with each image to a database 125.

Database 125 typically comprises a pre-programmed randomly accessible record of each image keyed to the alphanumeric identification code associated with the identifier tag worn by each person appearing in each image.

In accordance with a preferred embodiment of the present invention, following the event, once the identification apparatus 124 has downloaded the data corresponding to the images and the alphanumeric identification code or codes associated with each image to the database 125, any participant who wishes to view or obtain photographs in which he appears can access them electronically and print them out.

This can be done, in accordance with one embodiment of the present invention, by the participant using a computer 130, a printer 132 and a computer network 134, such as the Internet, entering a web site which provides access to database 125. Alternatively, the participant can send an e-mail message to a server which provides access to database 125.

Should the participant wish to receive the images electronically, he may enter or e-mail his alphanumeric code 122, and his e-mail address together with a request for all images associated with his identifier tag alphanumeric identification code 122. Should the participant wish to receive a hard copy, he may communicate in any suitable manner with image delivery apparatus 136 and provide a mailing address for delivery of a hard copy 128 of one or more images 123.

It is appreciated that conventional transaction software may be associated with database 125 and/or with image delivery apparatus 136 to enable payment to be obtained, if desired, for either or both of the virtual or hard-copy images.

Reference is now made to Fig. 12, which is a simplified flowchart illustration of a preferred method of detection and decoding of an identifier tag 116 of the present invention. As seen in Fig. 12, the identification apparatus, which is typically embodied in a conventional computer such as a PC, detects the presence and location of an identifier tag 116 in an image 123. Preferably both the identifier tag 116 and the image 123 are in color.

An image of the identifier tag 116 is then extracted from the remainder of the image 123 and the identifier tag 116 is decoded.



Reference is now made to Fig. 13 which illustrates a preferred method of detection of an identifier tag in accordance with a preferred embodiment of the present invention. It is seen at the outset that the method of Fig. 13 employs two independent detection techniques in parallel.

One of the techniques is a pattern recognition technique which converts the color image 123 (Fig. 10) to a grey scale and performs edge detection thereon. Subsequent to edge detection, the detected edges are correlated with predetermined shapes, typically a circular shape corresponding to the overall configuration of the identifier tag 116.

The other technique is a color detection technique which converts the color image 123 (Fig. 10) from RGB to another color base, such as HSV, and performs segmentation of the image according to color and intensity thresholds. Following segmentation, searching is carried out for a known color or colors of one or more regions of identifier tag 116. The known color may be white or any other suitable color.

The results of both detection techniques are ANDed together to provide a relatively robust indication of the presence and location of one or more suspected identifier tag 116 in an image 123. For each suspected identifier tag 116, spatial coordinates of the center thereof are determined. One or more identifier tag parameters are then checked. One such parameter may be the relative circumferences of the outer diameter of the suspected tags 116 as well as the outer diameter of the central region 118 thereof. Another such parameter may be a check that all colors appearing in segments 120 (Fig. 10) are within a set of predetermined colors.

Reference is now made to Fig. 14 which illustrates a preferred technique for decoding an identifier tag 116. The method of Fig. 14 preferably comprises RGB color enhancement of the extracted image of identifier tag 116, followed by conversion from RGB to another color base, such as HSV, segmentation of the image of extracted image according to color and intensity thresholds and searching for known colors of all of segments 120.

Once each segment is associated with a known color, a sequence of colors is detected circumferentially of the identifier tag 116, preferably at multiple radii. Once the color sequence has been determined with sufficient certainty, it is applied to a look up table to provide the alphanumeric code 122 (Fig. 10).

Reference is now made to Fig. 15, which is a simplified pictorial flow illustration of an image identification and delivery system constructed and operative in accordance with another preferred embodiment of the present invention and Fig. 16 which is a simplified flowchart illustration of a preferred mode of operation of the system of Fig. 15.

In the system of Fig. 15, one or more participants 210 are shown being photographed at an event, such as a reception, by a photographer 212 holding a camera 214. Camera 214 may be any known film or electronic camera capable of taking photographs, such as video photographs or still photographs. In contrast to the embodiment of Fig. 10, each participant 210 need not wear an identifier tag. In accordance with the present invention, the individual participants are recognized by using known and conventional face recognition techniques. Descriptions of some known techniques appear in the following U.S. Patents, the disclosure of which is hereby incorporated by reference: 4,975,969; 5,012,522; 5,164,992; 5,410,609; 5,430,809; 5,432,864; 5,524,065; 5,642,431; 5,644,765; 5,715,325; 5,729,619; 5,787,186; 5,801,763; 5,802,208; 5,805,720; 5,835,616; 5,850,470; 5,852,669.

A photographic image 223 taken of participants 210 by camera 214 is provided in electronic form to identification apparatus 224 either directly from a digital camera or via a scanner (not shown), when a film camera is employed.

Identification apparatus 224 preferably employs techniques well known in the art which may include techniques and use systems described in the aforesaid U.S. Patents, for identifying faces in the photographic image 223 and entering predetermined characteristics thereof in a database 225 together with images 223 in which those faces appear. Identification apparatus 224 preferably downloads both the images and the predetermined characteristics of faces appearing in each image to database 225.

Database 225 typically comprises a pre-programmed randomly accessible record of each image keyed to the predetermined characteristics of faces appearing in each image.

In accordance with a preferred embodiment of the present invention, following the event, once the identification apparatus 224 has downloaded the data corresponding to the images and the predetermined characteristics of the faces of

persons appearing therein, any participant who wishes to view or obtain photographs in which he appears can access them electronically.

This can be done, in accordance with one embodiment of the present invention, by the participant using a computer 230, a printer 232 and a computer network 234 such as the Internet, entering a web site which provides access to database 225. Alternatively, the participant can send an e-mail message to a server which provides access to database 225.

Should the participant wish to receive the images electronically, he may enter or e-mail an image of his face together with his e-mail address together with a request for all images in which he appears. Should the participant wish to receive a hard copy, he may communicate in any suitable manner with image delivery apparatus 236 provide a mailing address for delivery of hard copies 238 of the images 223. The image of the participant's face may be entered via a scanner (not shown) or alternatively by using a digital camera 240, associated with computer 230, which views the participant's face.

It is appreciated that in the embodiment of the invention shown in Fig. 15, the identification apparatus 224 preferably carries out correlation between the face image entered by the participant via computer 230 and the various predetermined characteristics of face images stored in database 225, so as to match the face image of the participant requesting an image 223 with one of the face images appearing in such an image 223.

It is further appreciated that various alternative data flows may be employed, such as pre-processing of face image data for extraction of predetermined characteristics by computer 230 or splitting of the feature extraction and correlation functionalities of identification apparatus 224 into two or more computers.

It is appreciated that conventional transaction software may be associated with database 225 and/or with image delivery apparatus 236 to enable payment to be obtained, if desired, for either or both of the virtual or hard-copy images.

Reference is now made to Figs. 17A & 17B which are simplified pictorial illustrations of an instantaneous personal identifier system constructed and operative in accordance with two preferred embodiments of the present invention. In the embodiment of Fig. 17A, a user, designated by reference numeral 300 carries an

instantaneous personal identifier assembly, preferably comprising a camera 302 which provides inputs to an identification subsystem 304. Camera 302 is preferably discretely located so that it is not normally seen.

The identification subsystem 304, which may operate much in the same manner as the identification apparatus 124 in the embodiment of Fig. 10, provides identification outputs to one or both of an audio annunciator 306, such as an earpiece, and a visual annunciator 308, such as a "head-up display" 310 associated with the user's eyeglasses 312. The identification outputs may provide the name of an identified person, as well as other relevant particulars of that person.

In the illustrated embodiment, the "identified" person wears an identifier tag 316, which may be similar in all relevant respects to identifier tag 116. The information on the identifier tag 116 is employed by the identification subsystem 304 to identify the person, whose tag is viewed by camera 302. For this purpose the identification subsystem 304 preferably employs a database 325, which may be similar in all relevant respects to database 125 in the embodiment of Fig. 10.

Turning now to the embodiment of Fig. 17B, there is shown an instantaneous personal identifier system which does not require the use of an identifier tag 116. This system operates based on face recognition, such as described in any of the above-listed U.S. Patents.

In the illustrated embodiment, a user, designated by reference numeral 400, carries an instantaneous personal identifier assembly, comprising a camera 402 which provides inputs to an identification subsystem 404. Camera 402 is preferably discretely located so that it is not normally seen.

The identification subsystem 404, which may operate much in the same manner as the identification apparatus 224 in the embodiment of Fig. 15, provides identification outputs to one or both of an audio annunciator 406, such as an earpiece, and a visual annunciator 408, such as a "head-up display" 410 associated with the user's eyeglasses 412. The identification outputs may provide the name of an identified person, as well as other relevant particulars of that person.

In the illustrated embodiment, the "identified" person need not wear an identifier tag, but is recognized by his facial features, which are stored in a database

425, which may be similar in all relevant respects to database 225 in the embodiment of Fig. 15.

Reference is now made to Fig. 18 which illustrates another embodiment of the present invention.

In the system of Fig. 18, one or more participants 110 are shown being photographed at an event, such as a reception, by a photographer 112 holding a camera 114. Camera 114 may be any known film or electronic camera capable of taking photographs, such as video photographs or still photographs.

Each participant 110 preferably wears an identifier tag 116. The identifier tag 116 may be in any suitable form, such as a badge, a pin, a sticker or a necklace or alternatively may be integrated with a worn garment.

In accordance with a preferred embodiment of the present invention, the identifier tag preferably comprises a color and pattern coded tag, having coding in at least two dimensions, such as color and position. Alternatively, the identifier tag may be coded in a greater or lesser number of dimensions, such as only color. It is important, however, that the identifier tag be readily detectable to a degree allowing for straightforward decoding thereof by automatic scanning apparatus, wherein variations in camera angles and lighting do not generally defeat successful detection.

A preferred form of identifier tag 116 is a generally circular tag, as shown, having a circular central region 118 surrounded by variously colored segments 120, the coding of which readily identifies the wearer and corresponds to an numeric identification code 122, which is preferably printed on the tag 116.

Identification code 122 may be printed on the back of the tag 116 or alternatively at any appropriate location on the front thereof, such as in the central region 118 or in one or more of colored segments 120. It is appreciated that the color coded identifier tag described hereinabove and shown in Fig. 1 is much more readily detectable and decodable than would be a conventionally bar-coded tag of similar size.

A photographic image 123 taken of participants 110 by camera 114 is provided in electronic form to identification apparatus 124 either directly from a digital camera or via a scanner (not shown), when a film camera is employed.

Identification apparatus 124 preferably employs techniques well known in the art for locating identifier tag 116 within the photographic image 123, decoding the tag and

associating each photographic image 123 with the numeric identification code 122 corresponding to each person appearing in the photographic image. Identification apparatus 124 preferably downloads both the images and the alphanumeric identification code or codes associated with each image to a database 125.

Database 125 typically comprises a pre-programmed randomly accessible record of each image keyed to the alphanumeric identification code associated with the identifier tag worn by each person appearing in each image.

In accordance with a preferred embodiment of the present invention, following the event, once the identification apparatus 124 has downloaded the data corresponding to the images and the alphanumeric identification code or codes associated with each image to the database 125, any participant who wishes to obtain photographs in which he appears can dial a certain phone number and using the telephone key pad to enter his code.

This can be done, in accordance with one embodiment of the present invention, by the participant using a telephone 130 and a telecommunication network 134, calling a certain telephone number and entering the access code to database 125.

The Image Delivery Apparatus 136 may detect the caller's phone number and using telephone directory database 137 to obtain the caller address.

It is appreciated that conventional transaction software may be associated with database 125 and/or with image delivery apparatus 136 to enable payment to be obtained, if desired, for either or both of the virtual or hard-copy images.

The payment method can be using the caller's phone bill or any suitable manner.

An example of a tag is now described.

Preferred badge definition:

An example of a suitable badge is shown in Fig. 19. It typically comprises two parts. The first part corresponds to a "Text Area" where written information can appear. The second part corresponds to the "Color-coded identifiers" area. It may comprise a centered "Flower" and an additional "Inclination segment". The "Flower" may comprise six color segments numbered in Fig. 19 from #1 to #6. The "Inclination segment" has the number #7.

Preferred "Color-coded identifiers" features:

The "Color-coded identifiers" may have the following properties, in the illustrated embodiment:

The badge may be printed on non-glossy white paper.

The internal circle of the "Flower" may be white and surrounded by a 1mm width black line.

The internal circle diameter of the "Flower" may equal 10mm.

The outer diameter of the "Flower" typically equals 30mm.

The outer perimeter color of the "Flower" may be a black line of 1mm width.

The badge may be printed on a white paper with an outer margin of 7mm from the perimeter of the "Flower".

The segment colors may be one of the example valid colors described in the table of Fig. 20.

Two consequent segments typically do not have the same color.

The "Inclination segment" is typically tangent to the segment #5 as shown in Fig. 19.

In the illustrated embodiment, the diameter of segment #7 equals 10mm.

Segment #7 is also surrounded by a 1mm width black line.

The color of segment #7 may be one of the valid colors and has to be different from the color of segment #5.

Typical camera type and settings may be as follows:

Camera type : Nikon coolpix 900 digital camera

Picture quality : High

Suitable photographic conditions may be as follows:

Field of view : between 70cm to 150cm.

The photographs are typically taken with a flash.

The distance of the object is typically approximately 2 meters.

An authorized code is composed of 9 digits. The first three digits are constant digits (i.e., 898 ). The following 6 digits are the decoded numbers corresponding to the numbered segments (from #1 to #6) as described in Fig. 20.

It is appreciated that various features of the invention which are, for clarity, described in the contexts of separate embodiments may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment may also be provided separately or in any suitable subcombination.

It is appreciated that elements of the present invention described hereinabove may be implemented in hardware, software, or any suitable combination thereof using conventional techniques.

It is appreciated that the software components of the present invention may, if desired, be implemented in ROM (read-only memory) form. The software components may, generally, be implemented in hardware, if desired, using conventional techniques.

It is appreciated that various features of the invention which are, for clarity, described in the contexts of separate embodiments may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment may also be provided separately or in any suitable subcombination.

It will be appreciated by persons skilled in the art that the present invention is not limited to what has been particularly shown and described hereinabove. Rather, the scope of the present invention includes both combinations and subcombinations of the various features described hereinabove as well as modifications and additions thereto which would occur to a person of ordinary skill in the art upon reading the foregoing description and which are not in the prior art.



## C L A I M S

What is claimed is:

1. A method for providing pre- and post-event communication with a participant in a gathering comprising the steps of:
  - transmitting an invitation to an intended participant, wherein the invitation is associated with an electronic record of the participant;
  - producing a photograph of said participant wherein the participant is identified with said electronic record; and
  - providing the photograph to said participant by using said electronic record.
2. A method for providing pre- and post- event communication with a participant in a gathering comprising the steps of:
  - transmitting an invitation to an intended participant, wherein the invitation is associated with an electronic record of the participant and the gathering;
  - providing the intended participant access to a gift wish list via said electronic record;
  - selling a gift to the intended participant using said electronic record;
  - updating said gift wish list based on a past purchase, using said electronic record; and
  - generating a thank-you note using said electronic record and purchase record associated therewith.
3. A method according to claim 2 and also comprising the steps of:
  - producing a photograph of said participant wherein the participant is identified with said electronic record; and
  - providing the photograph to said participant by using said electronic record.
4. A method according to claim 3 and wherein the photograph is provided to said participant together with said thank you note.

5. A method according to any of the preceding claims and wherein at least some of the communication with the participant is electronic.
6. A method for distributing a photograph to a participant in a gathering comprising the steps of:
  - producing a photograph of the participant wherein the participant is identified with an electronic record; and
  - providing the photograph to said participant by using said electronic record.
7. A method according to any of claims 1, 3 and 6 and wherein said step of producing said photograph of said participant comprises the step of associating an individualized computer readable identifier with said participant;
  - and said step of providing the photograph comprises the step of employing said identifier to associate said photograph with said participant and said electronic record.
8. A method according to claim 7 and wherein said step of producing said photograph includes the step of eliminating said identifier from the photograph.
9. A method according to claim 6 and wherein said providing step includes posting the photograph on the Internet.
10. A method for providing photographs of participants in an event to those participants comprising the steps of:
  - providing to each participant an identifier tag;
  - photographing participants wearing said identifier tags;
  - detecting and decoding identifier tags;
  - associating images which include a tag with at least one alphanumeric code corresponding to an identifier tag worn by a participant; and
  - ordering images by participants supplying said alphanumeric code.

11. A method according to claim 10 and wherein said identifier tag is a color coded identifier tag.
12. A method according to either of claims 10 and 11 and wherein said step of ordering images includes the step of communicating said alphanumeric code via a computer network.
13. A method according to any of claims 10 - 12 and wherein said step of ordering images includes the step of communicating image data via a computer network.
14. A method for providing photographs of participants in an event to those participants comprising the steps of:  
photographing participants;  
associating images which include at least one participant's face with information relating to that participant's face; and  
ordering images by a participant by supplying at least characteristics of the participant's face.
15. A method of providing recognition information to a user meeting a person to be recognized comprising the steps of:  
providing an identifier tag to a person to be recognized;  
using a camera, viewing a person to be recognized wearing said identifier tag;  
detecting and decoding said identifier tag;  
associating said identifier tag with identification data relating to a known person using a database; and  
supplying said identification data to said user.
16. A method according to claim 15 and wherein said identifier tag is a color coded identifier tag.

17. A method according to either of claims 15 and 16 and wherein said step of supplying said identification data comprises supplying an audio input to said user.
18. A method according to either of claims 15 and 16 and wherein said step of supplying said identification data comprises supplying a visually sensible input to said user.
19. A method of providing recognition information to a user meeting a person to be recognized comprising the steps of:  
using a camera, viewing a person to be recognized;  
associating an image provided by said camera with identification data relating to a known person using a database; and  
supplying said identification data to said user.
20. A method according to claim 19 and wherein said step of supplying said identification data comprises supplying an audio input to said user.
21. A method according to claim 19 and wherein said step of supplying said identification data comprises supplying a visually sensible input to said user.
22. A system for providing pre- and post-event communication with a participant in a gathering comprising:  
an invitation transmitter, transmitting an invitation to an intended participant, wherein the invitation is associated with an electronic record of the participant;  
a photograph generator, producing a photograph of said participant wherein the participant is identified with said electronic record; and  
a photograph distributor, providing the photograph to said participant by using said electronic record.

23. A system for providing pre- and post- event communication with a participant in a gathering comprising the steps of:

an invitation transmitter, transmitting an invitation to an intended participant, wherein the invitation is associated with an electronic record of the participant and the gathering;

a gift database, providing the intended participant access to a gift wish list via said electronic record;

transaction software, selling a gift to the intended participant using said electronic record;

a database input device, updating said gift wish list based on a past purchase, using said electronic record; and

an acknowledgement system, generating a thank-you note using said electronic record and purchase record associated therewith.

24. A system according to claim 23 and also comprising:

a photograph generator, producing a photograph of said participant wherein the participant is identified with said electronic record; and

a photograph generator, providing the photograph to said participant by using said electronic record.

25. A system according to claim 24 and wherein the photograph is provided to said participant together with said thank you note.

26. A system according to any of the preceding claims 22 - 24 and wherein at least some of the communication with the participant is electronic.

27. A system for distributing a photograph to a participant in a gathering comprising the steps of:

a photograph generator, producing a photograph of the participant wherein the participant is identified with an electronic record; and

a photograph distributor, providing the photograph to said participant by using said electronic record.

28. A system according to any of claims 22, 24 and 27 and wherein:  
said photograph generator comprises an associator, associating an individualized computer readable identifier with said participant;  
and said photograph distributor employs said identifier to associate said photograph with said participant and said electronic record.
29. A system according to claim 28 and wherein said photograph generator is operative to eliminate said identifier from the photograph.
30. A system according to claim 27 and wherein said photograph distributor is operative to post the photograph on the Internet.
31. A system for providing photographs of participants in an event to those participants who are photographed wearing identifier tags comprising:  
a detector and a decoder for detecting and decoding identifier tags;  
a database, associating images which include a tag with at least one alphanumeric code corresponding to an identifier tag worn by a participant; and  
an image distributor providing said images in response to receipt of said alphanumeric code.
32. A system according to claim 31 and wherein said identifier tag is a color coded identifier tag.
33. A system according to either of claims 31 and 32 and wherein said image distributor employs communication of said alphanumeric code via a computer network.
34. A system according to any of claims 31 - 33 and wherein said image distributor employs communication of image data via a computer network.
35. A system for providing photographs of participants in an event to those participants comprising:

a database, associating images which include at least one participant's face with information relating to that participant's face; and

an image distributor providing images of a participant in response to receipt of at least characteristics of the participant's face.

36. A system of providing recognition information to a user meeting a person to be recognized comprising the steps of:

an identifier tag worn by a person to be recognized;

a camera viewing a person to be recognized wearing said identifier tag;

a detector and a decoder operative to detect and decode said identifier tag;

a database, associating said identifier tag with identification data relating to a known person; and

an identification data user interface, supplying said identification data to said user.

37. A system according to claim 36 and wherein said identifier tag is a color coded identifier tag.

38. A system according to either of claims 36 and 37 and wherein said identification data user interface is operative to supply an audio input to said user.

39. A system according to either of claims 36 and 37 and wherein said identification data user interface is operative to supply a visually sensible input to said user.

40. A system of providing recognition information to a user meeting a person to be recognized comprising the steps of:

a camera viewing a person to be recognized;

a database, associating an image provided by said camera with identification data relating to a known person; and

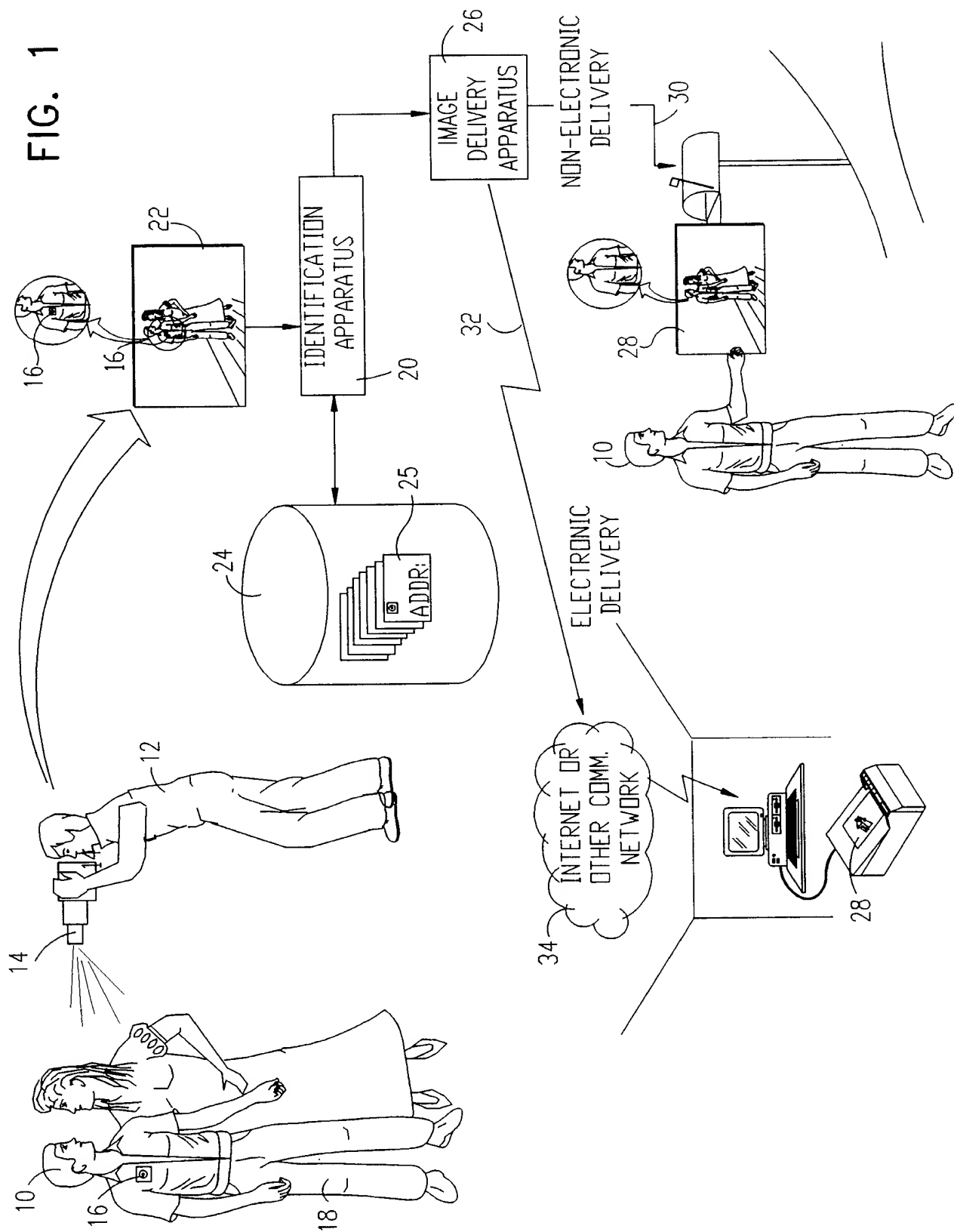
an identification data user interface, supplying said identification data to said user.

41. A system according to claim 40 and wherein said identification data interface supplies an audio input to said user.

42. A system according to claims 40 and wherein said identification data interface comprises supplying a visually sensible input to said user.

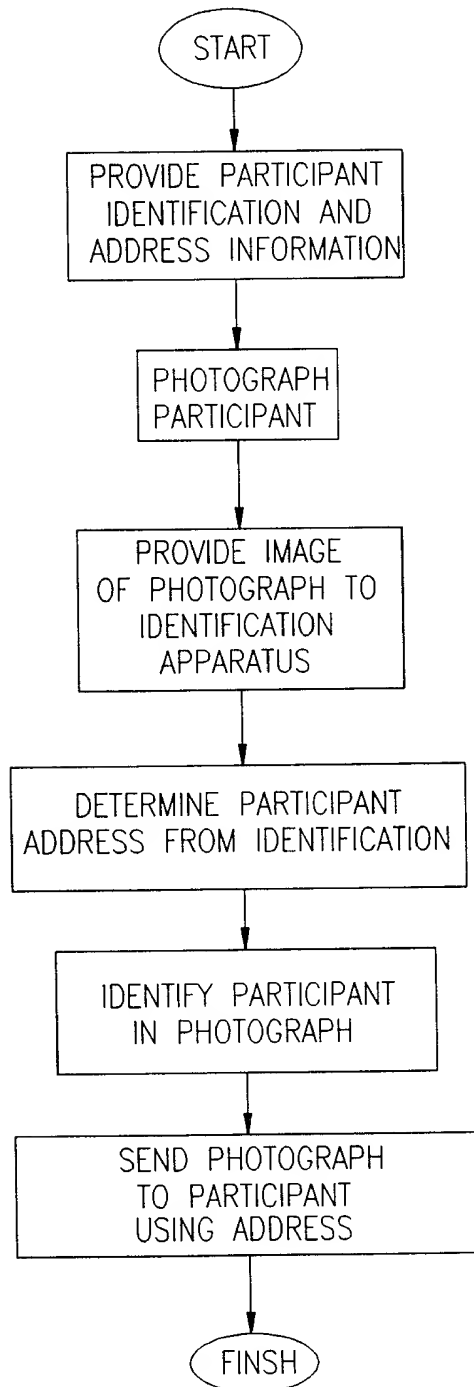


FIG. 1



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FIG. 2



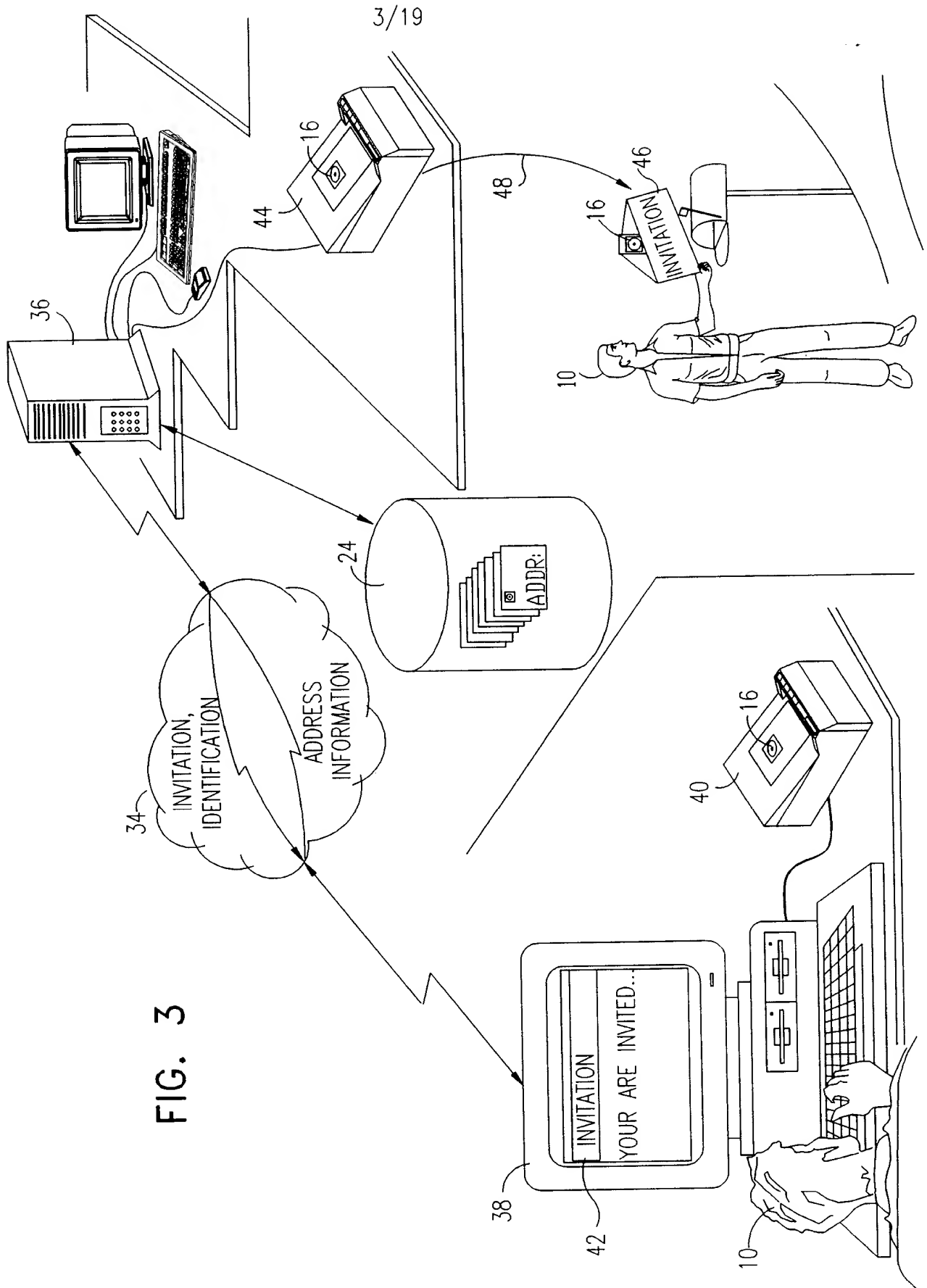
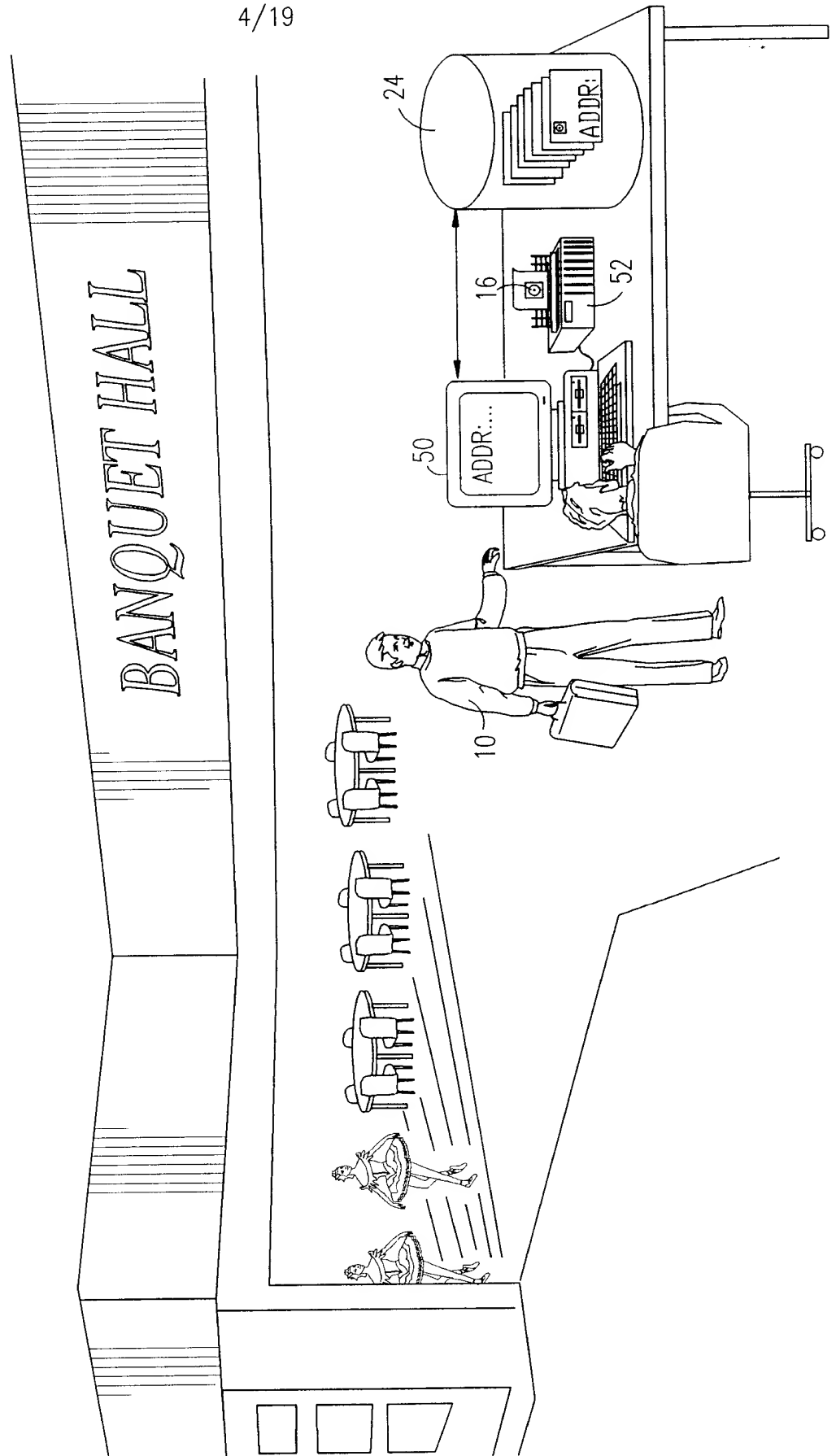


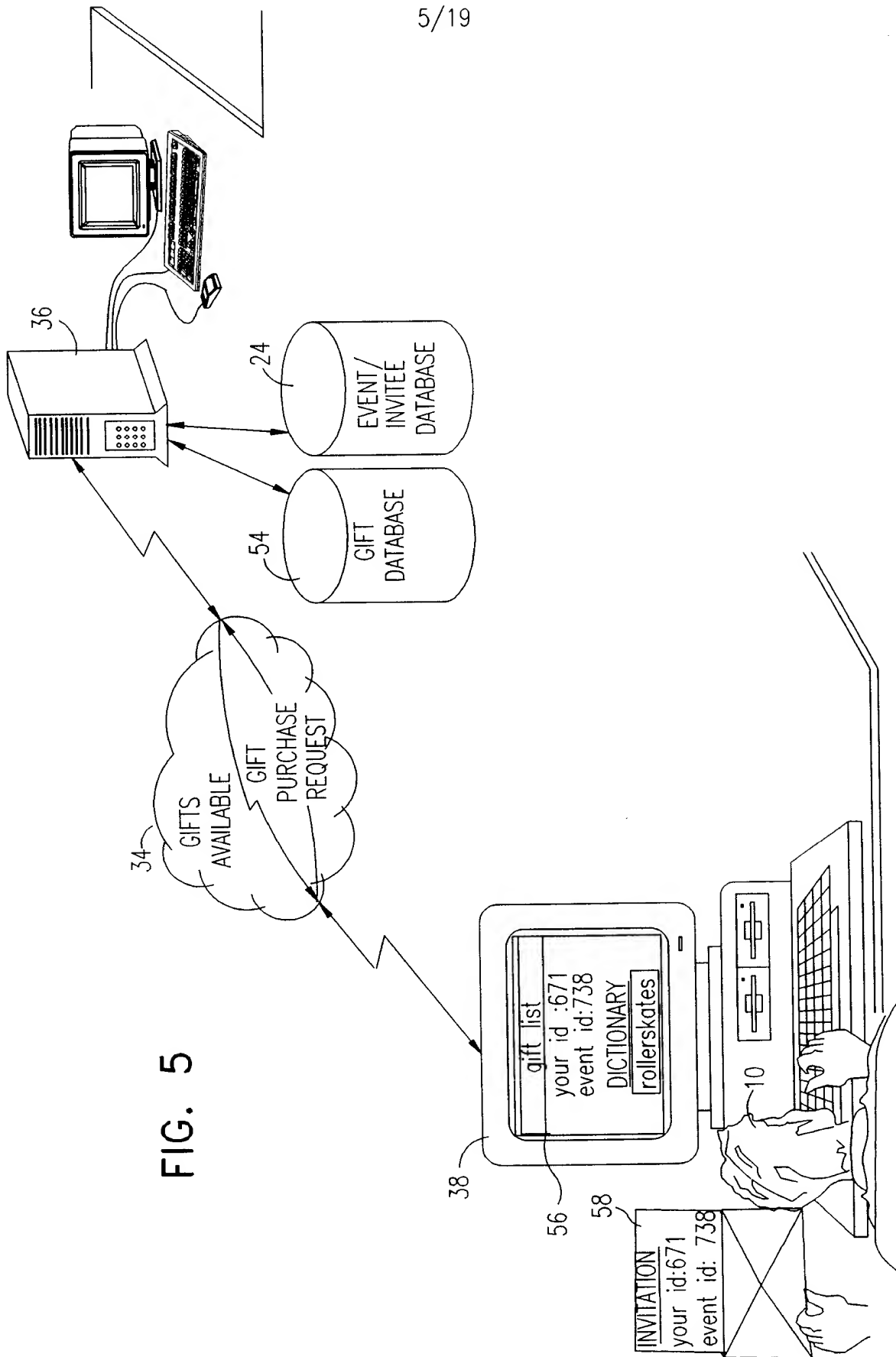
FIG. 3

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FIG. 4



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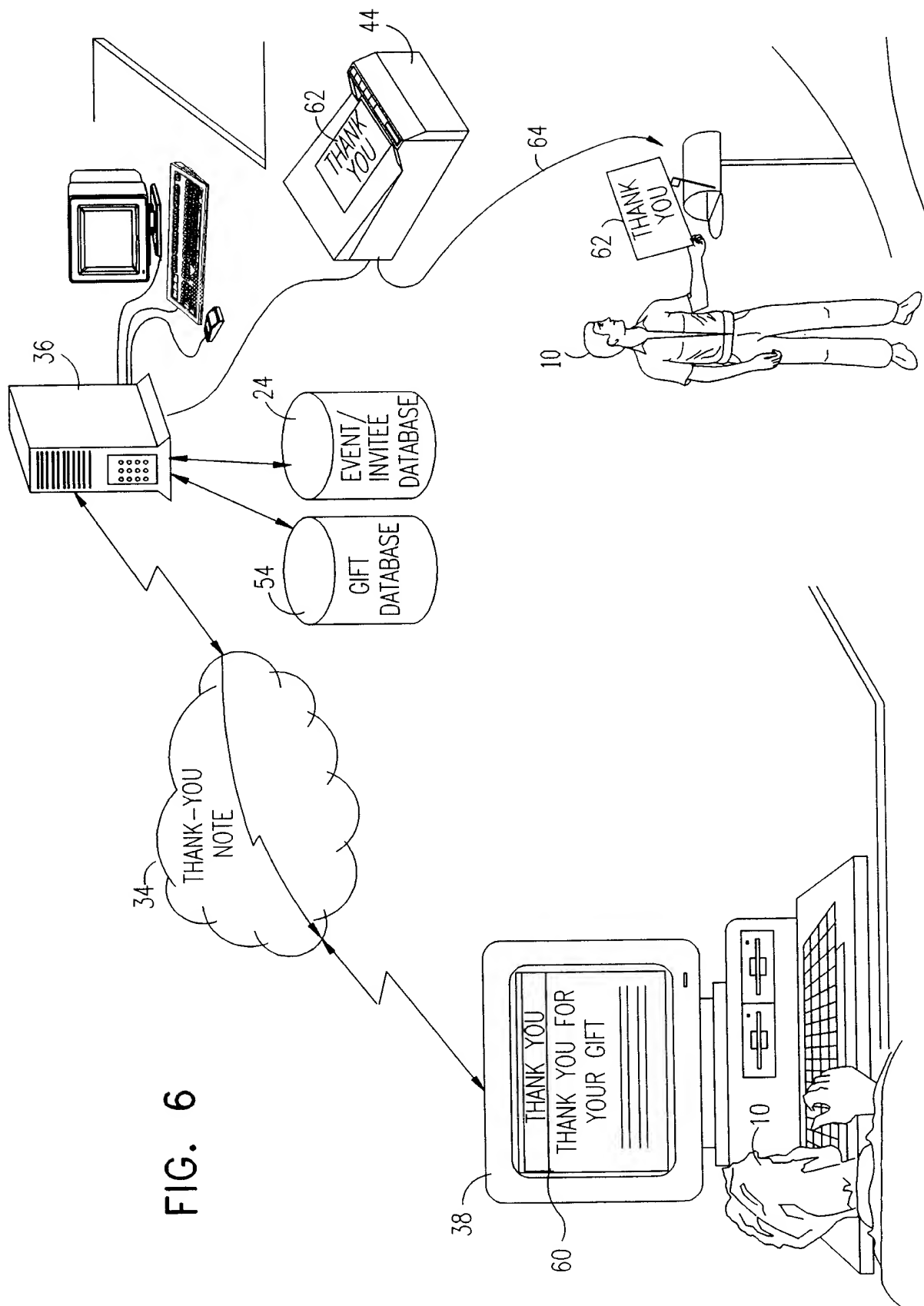
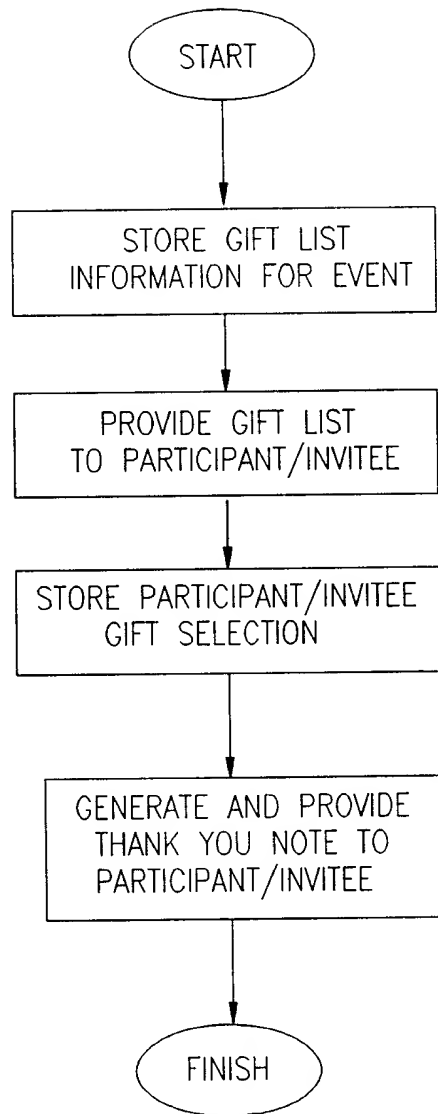


FIG. 6

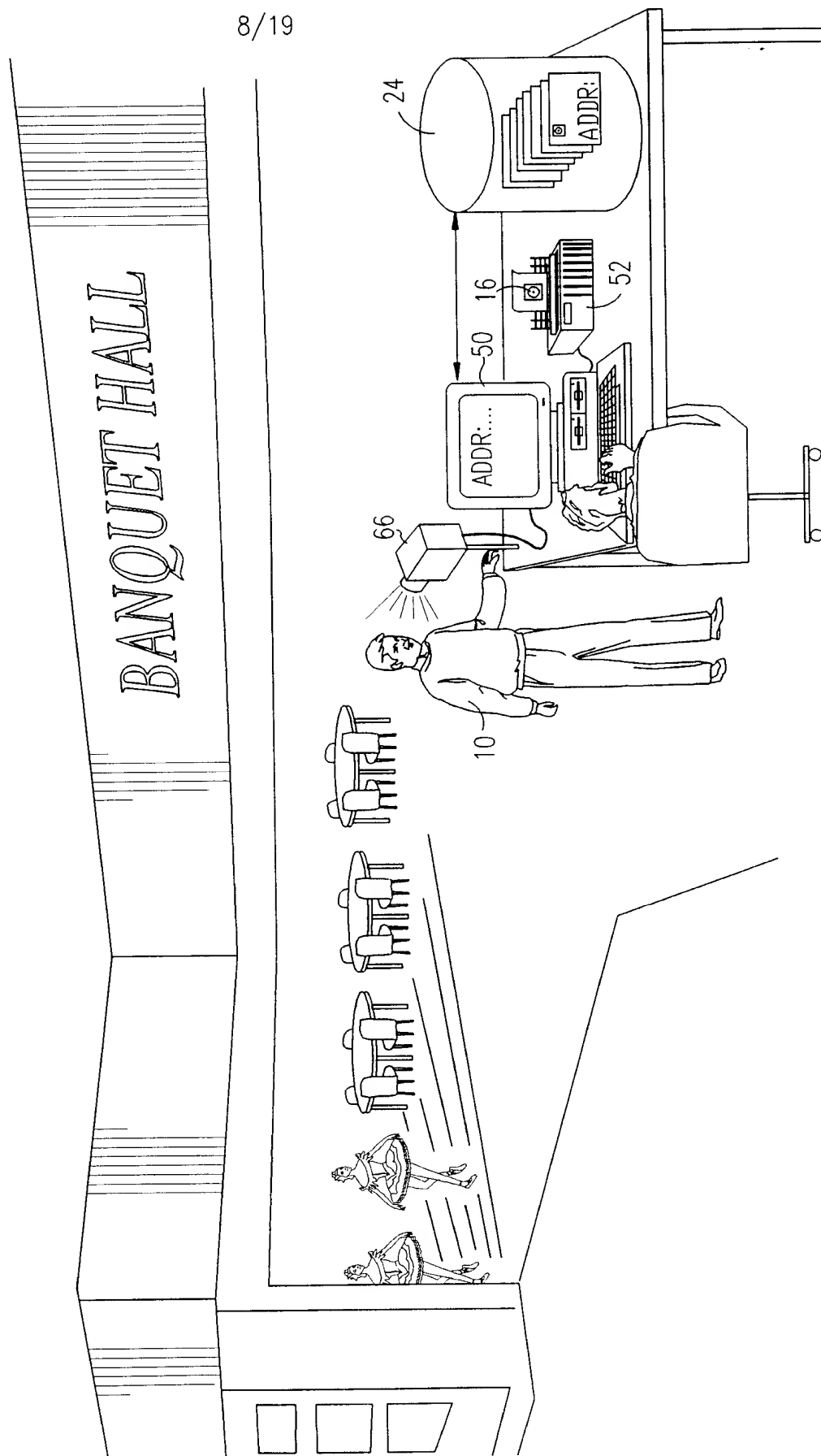
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FIG. 7

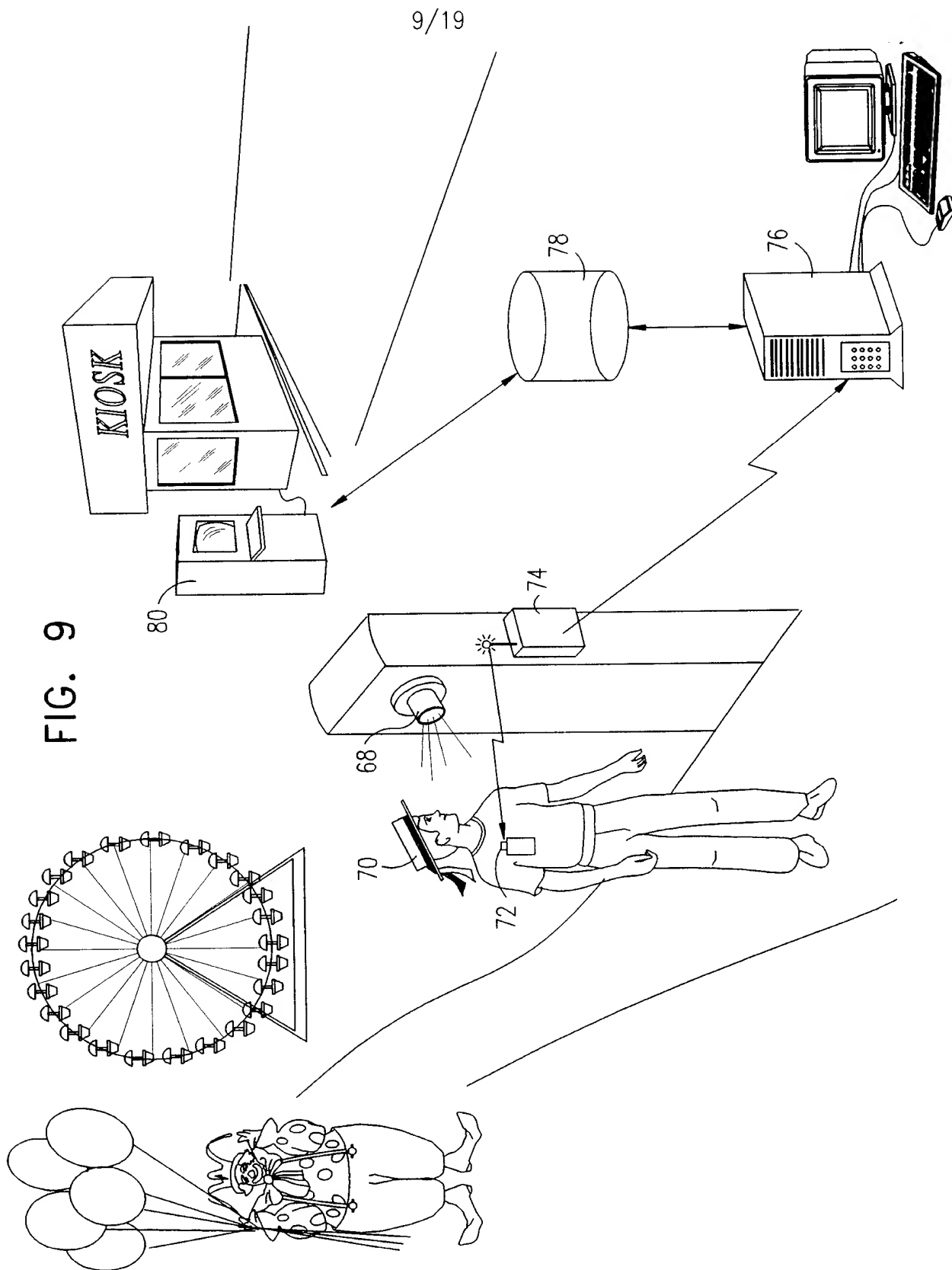


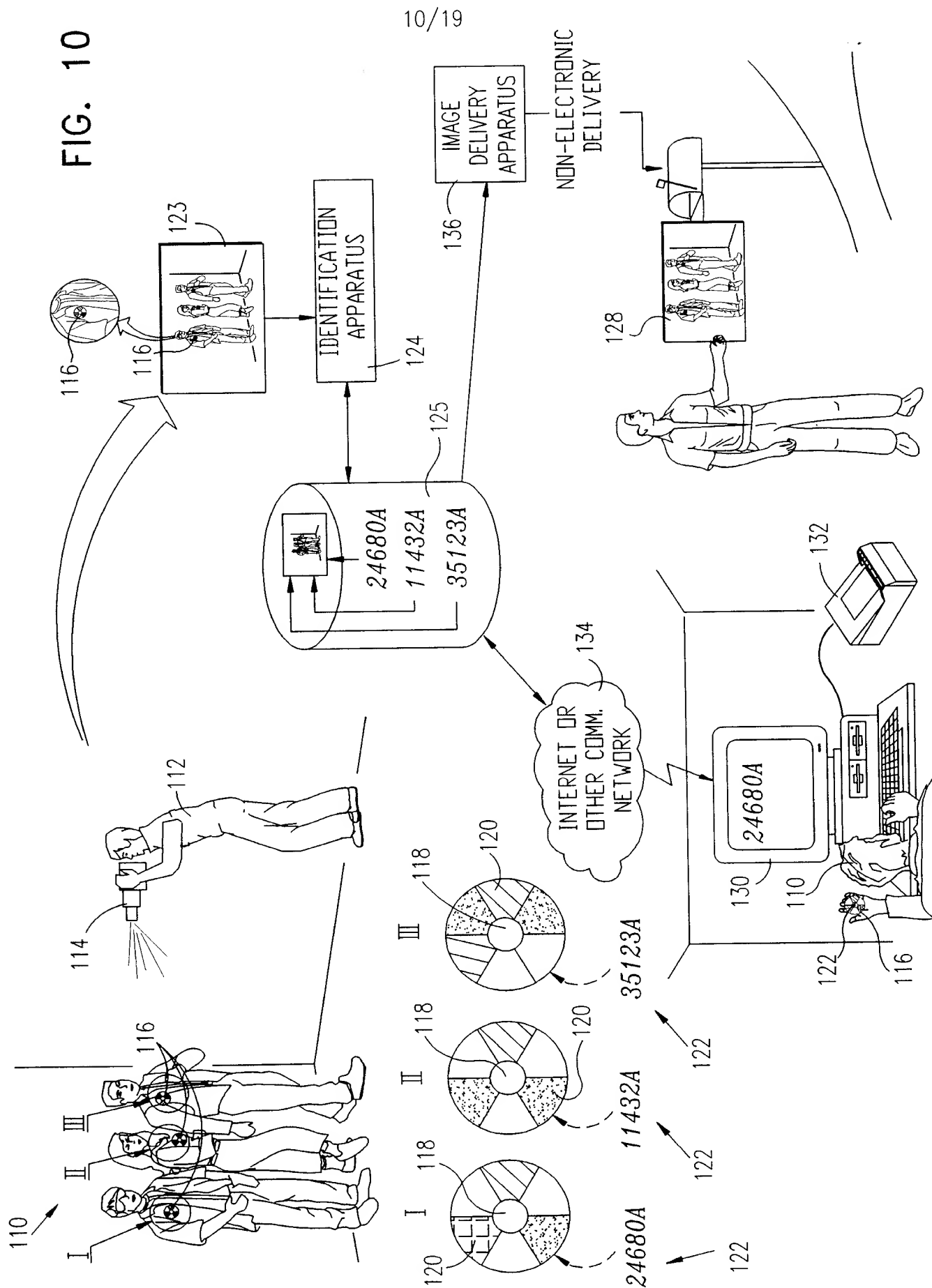
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FIG. 8









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FIG. 11

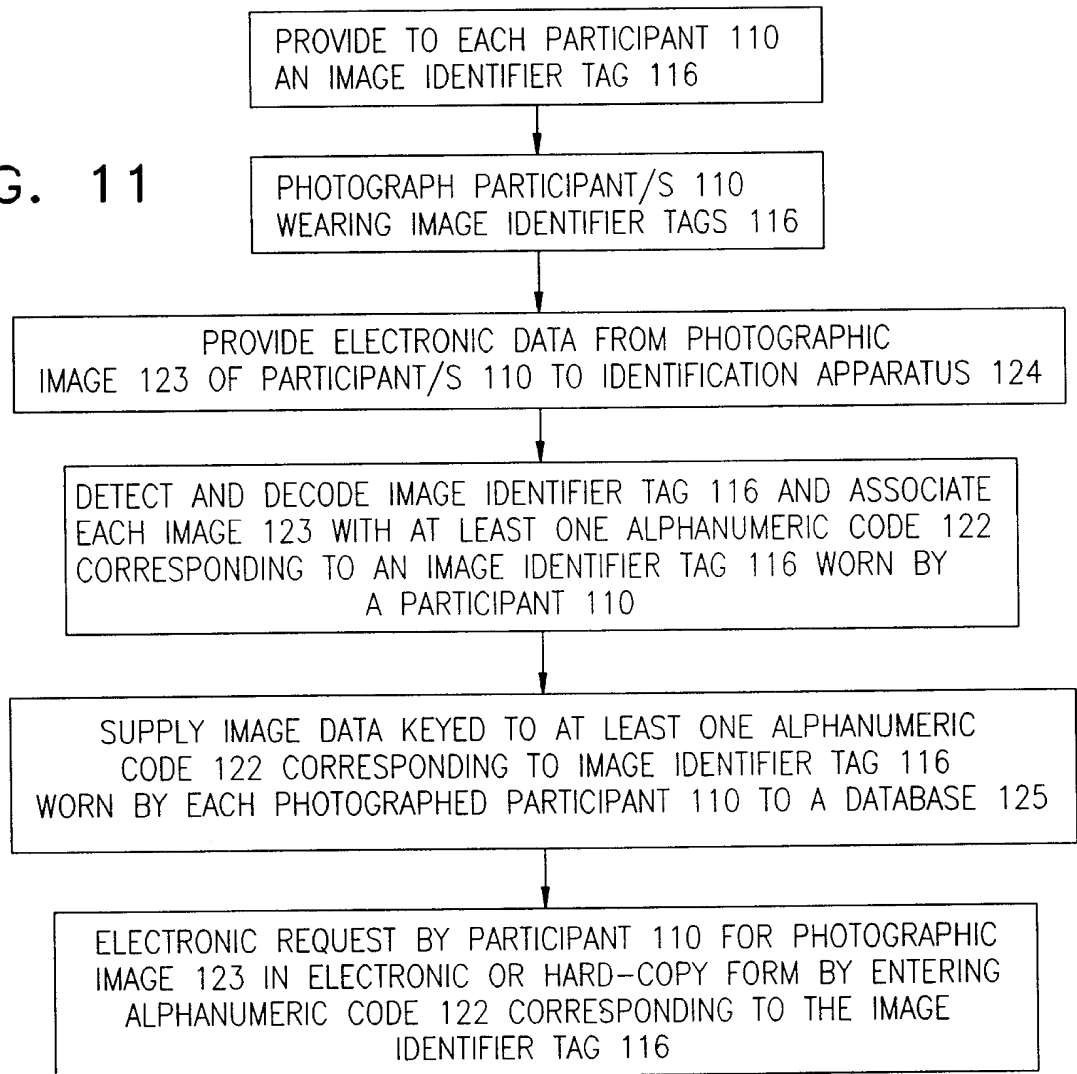


FIG. 12

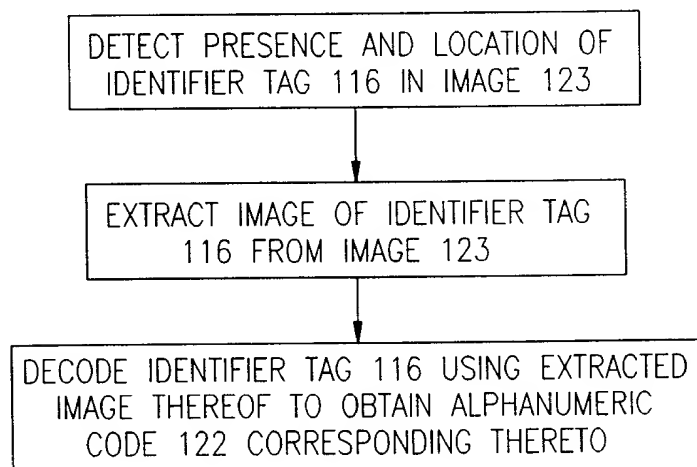
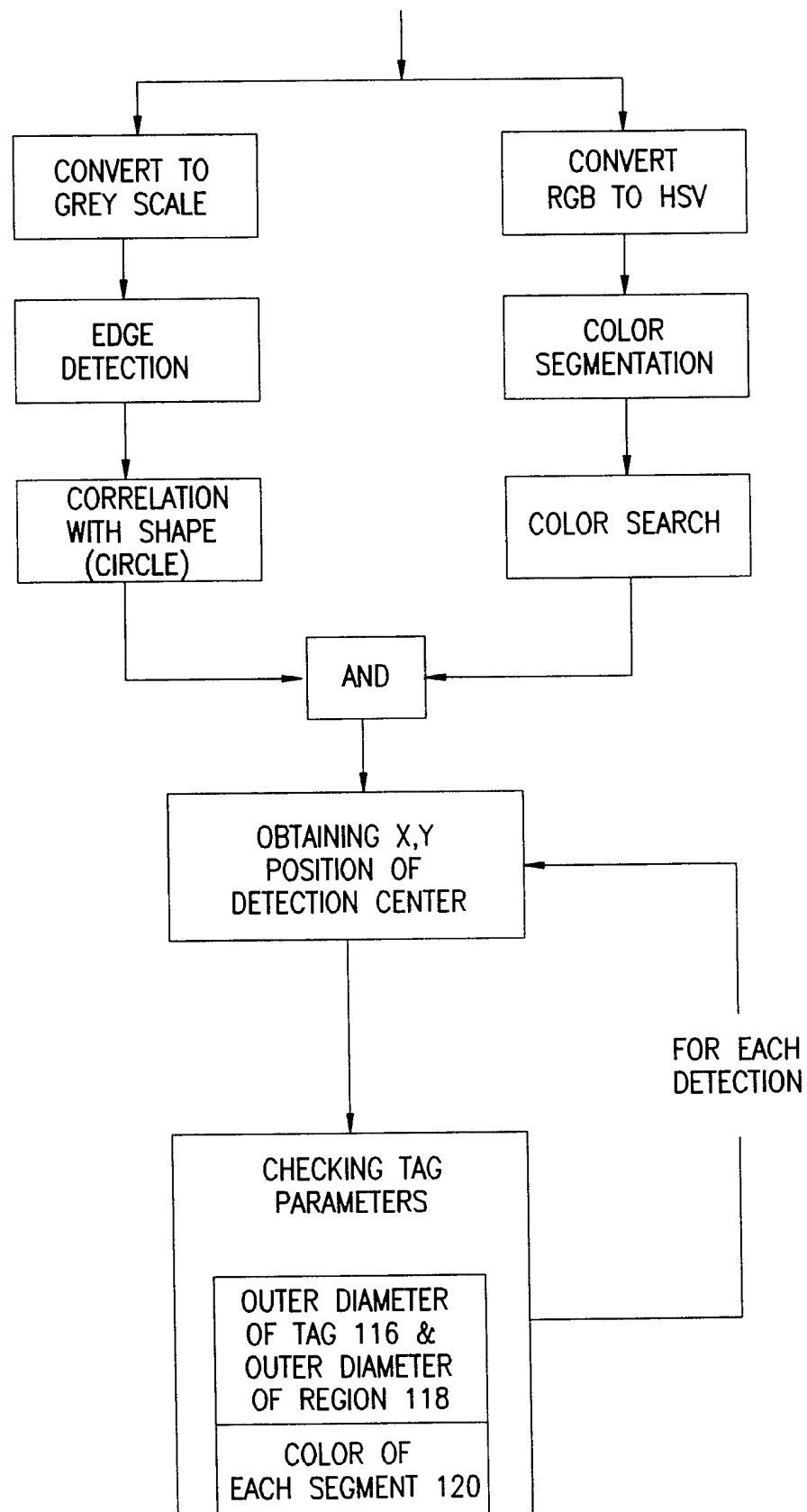


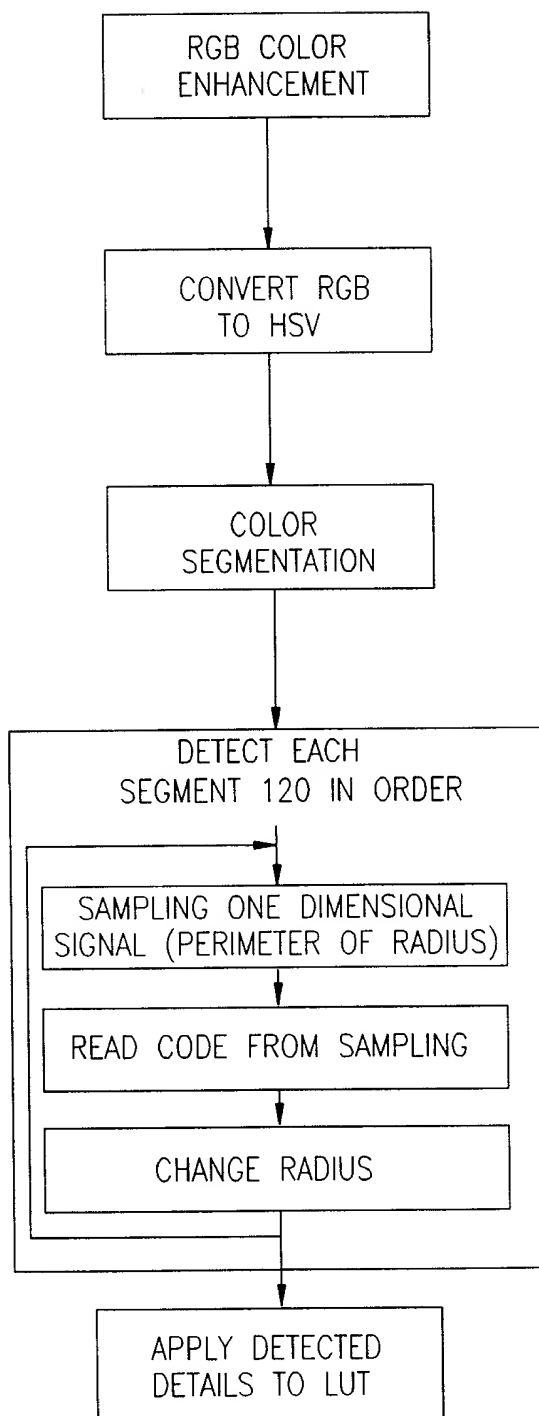
FIG. 13

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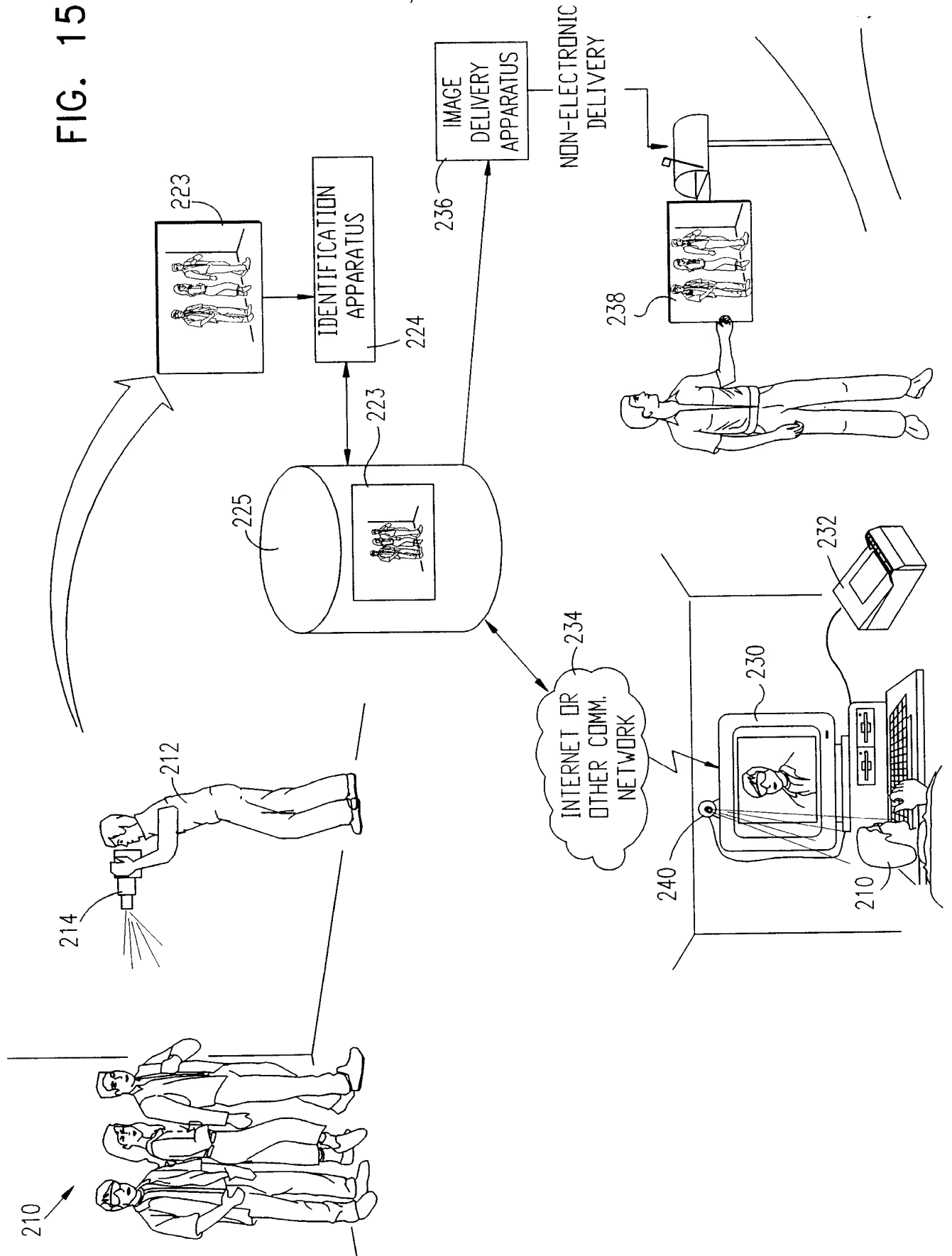
13/19

FIG. 14



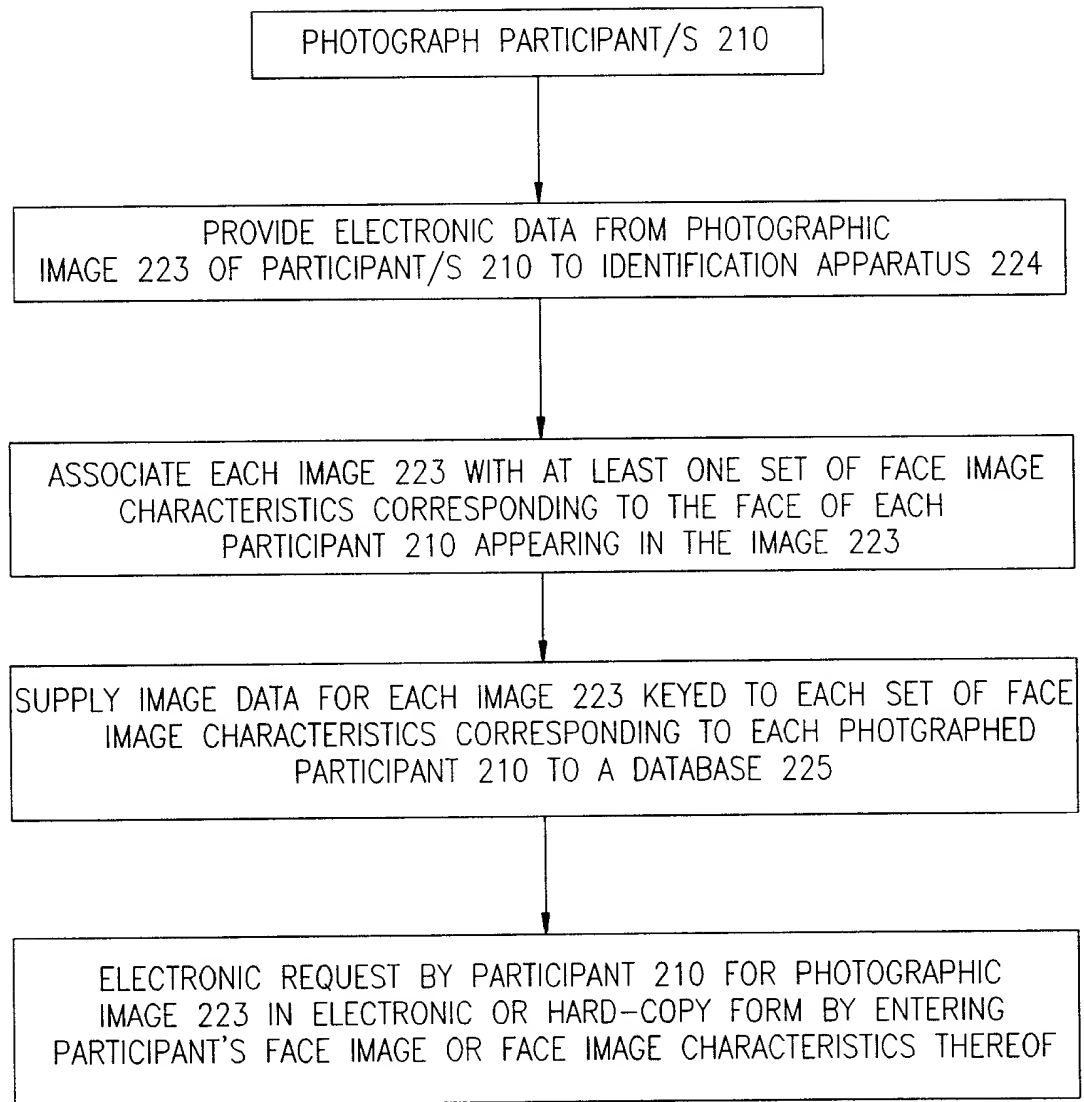
14/19

FIG. 15

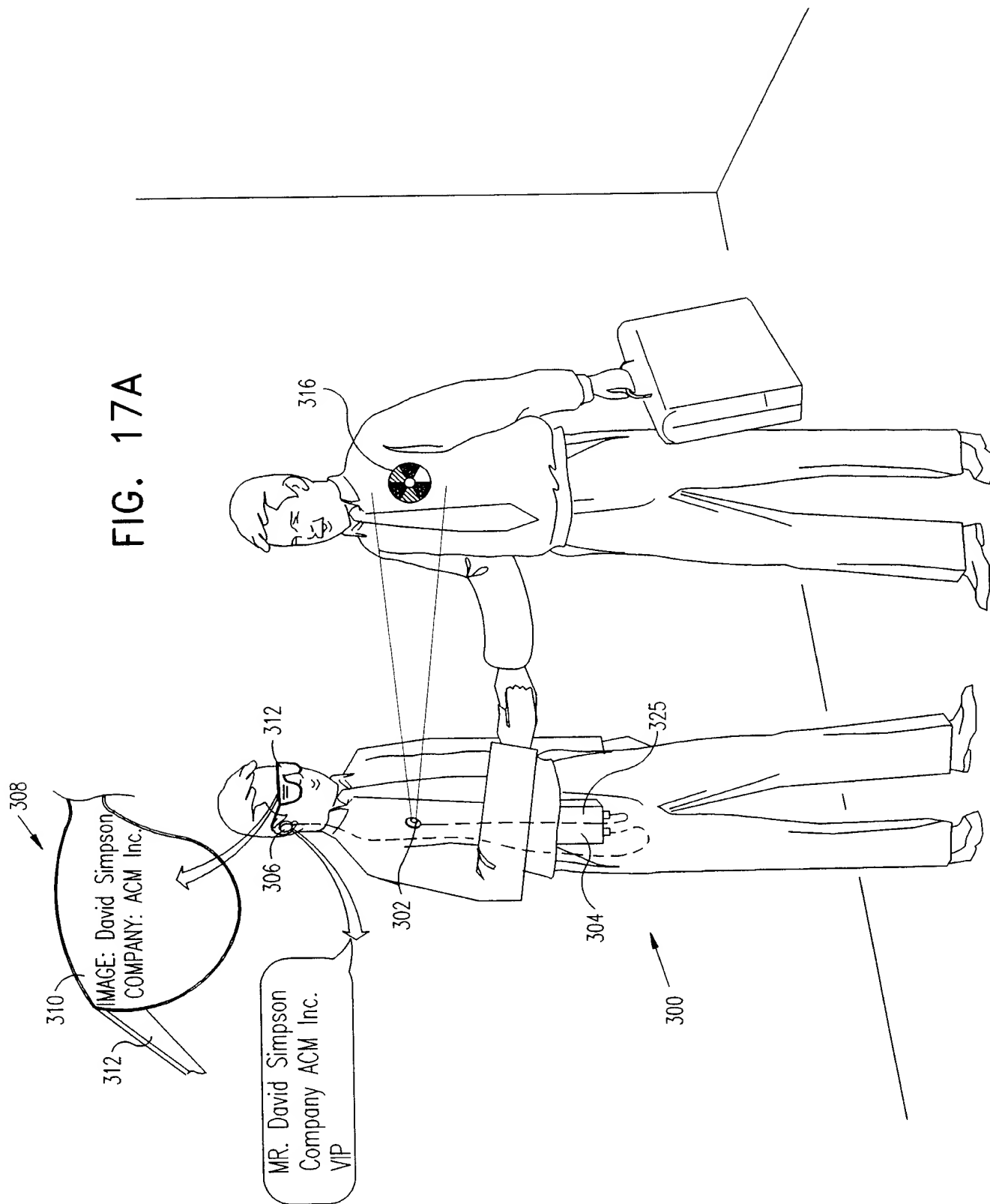


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FIG. 16



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FIG. 17B

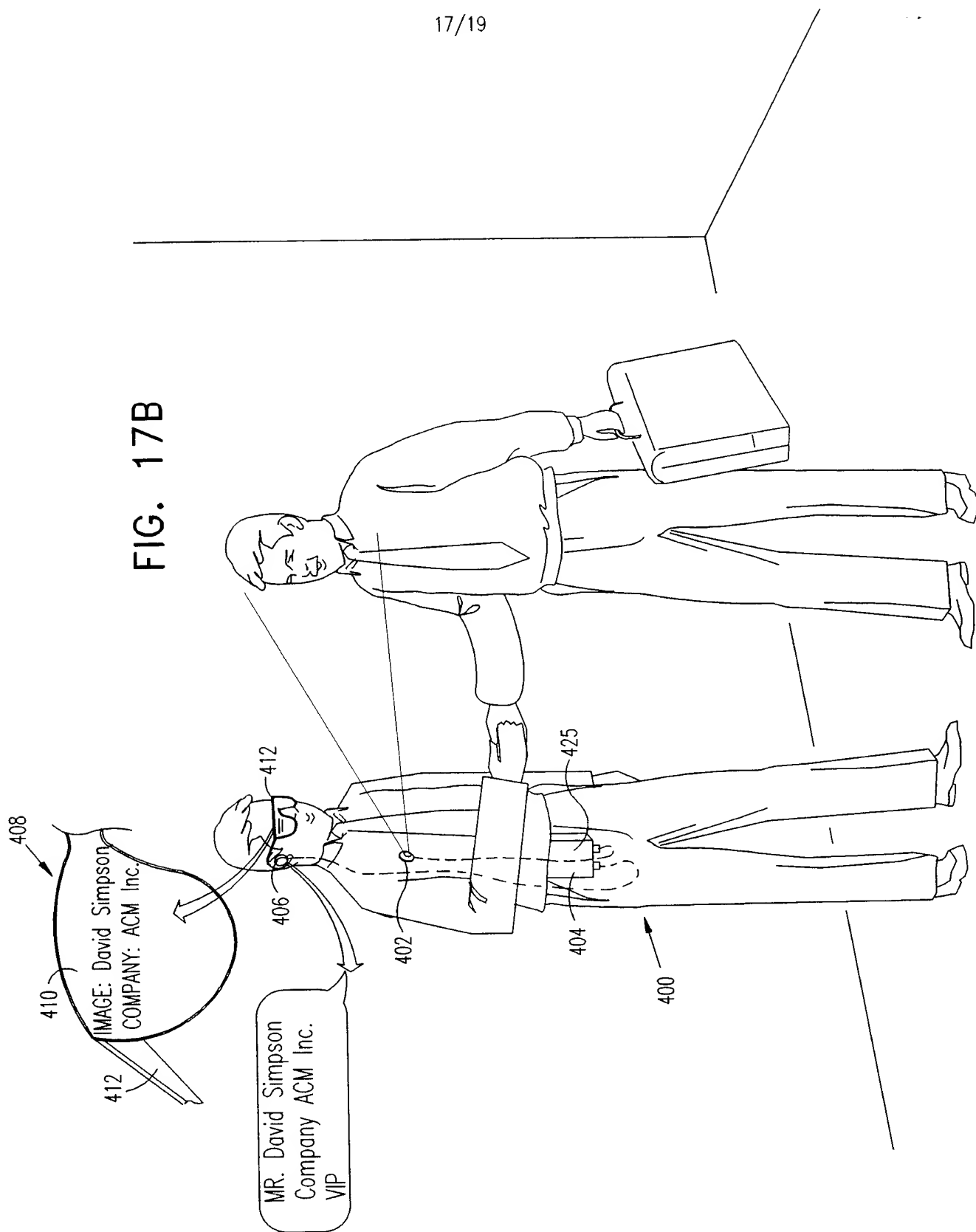
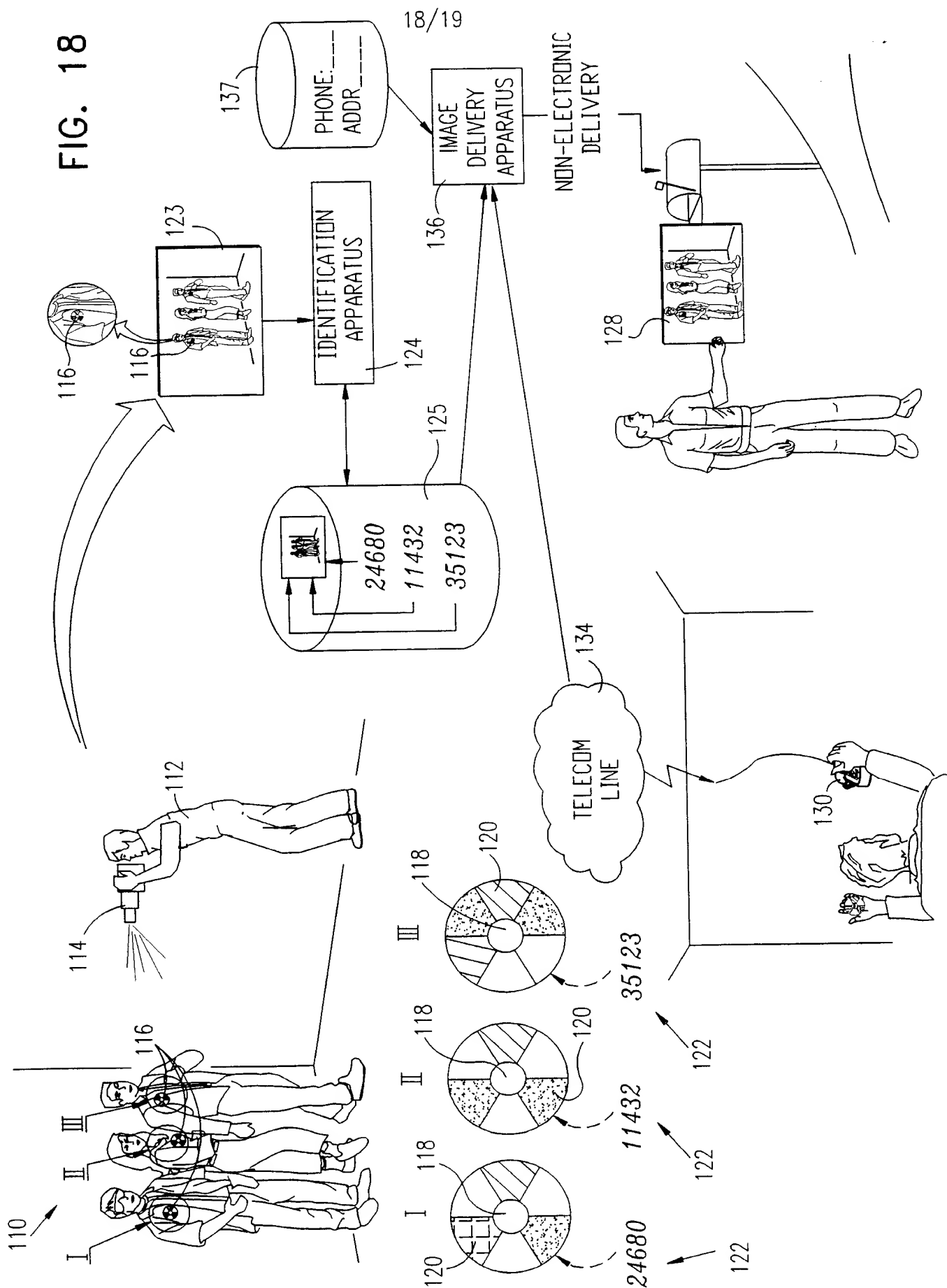


FIG. 18



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FIG. 19

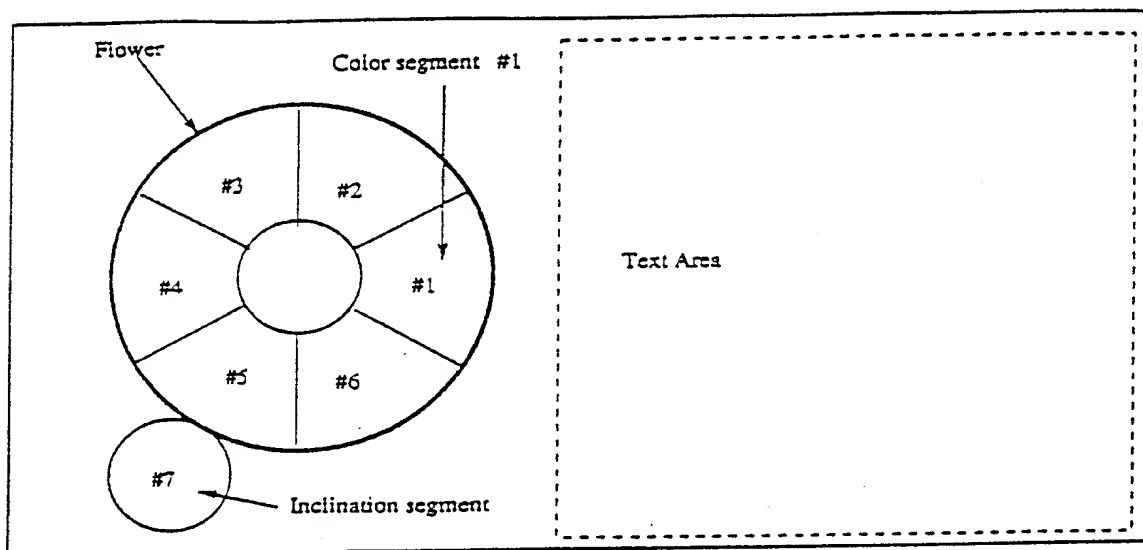


FIG. 20

color	R	G	B	code
black	0	0	0	1
blue	0	200	255	2
green	0	255	0	3
red	255	0	0	5
yellow	255	255	0	7

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL99/00385

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : H04N 5/91, 7/00; G06K 9/00

US CL : 382/115, 116, 118; 386/46

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 382/115, 116, 118; 386/46; 358/335, 342; 705/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EAST

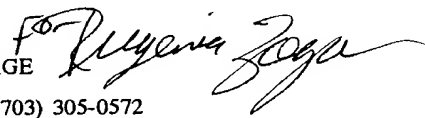
search terms: transmi\$, image, photograph, recogn\$, facial

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,694,514 A (EVANS et al) 02 December 1997, col. 2, line 26- col. 10, line 42.	1, 6, 7-22, 26-42
Y	BRANDOWSKI, PAUL. Stores Without Doors: Kiosks Generate New Profits. Corporate Computing, October 1992. Vol. 1, No. 5. pages 193-196.	2-5, 14, 23, 24, 25
Y	US 5,550,928 A (LU et al) 27 August 1996, col. 9, lines 44 - col. 14, line 44.	2-5, 14, 23, 24, 25

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 04 DECEMBER 1999	Date of mailing of the international search report <b>23 DEC 1999</b>
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer SHAWN B. CAGE  Telephone No. (703) 305-0572